

RESOLUTION 2013-165

A RESOLUTION OF THE CITY COMMISSION OF THE CITY OF FERNANDINA BEACH, FLORIDA, APPROVING AN INTERLOCAL AGREEMENT WITH THE BOARD OF COUNTY COMMISSIONERS OF NASSAU COUNTY FOR THE RENOVATION AND EXPANSION OF THE FERNANDINA BEACH BRANCH OF THE NASSAU COUNTY LIBRARY LOCATED AT 25 NORTH 4TH STREET AND ACCEPTING A COMMITMENT OF \$600,000 FROM NASSAU COUNTY TOWARD THE PROJECT; AUTHORIZING EXECUTION; AND PROVIDING FOR AN EFFECTIVE DATE.

WHEREAS, the Board of County Commissioners of Nassau County has agreed to contribute a maximum of \$600,000 toward the cost of renovations and expansion of the Fernandina Beach Branch of the Nassau County Library located in the City-owned building at 25 North 4th Street in exchange for a 20-year lease and City acceptance of the \$600,000 County payment as rent for the entire 20-year term of the lease; and

WHEREAS, the City Commission believes it is in the best interests of the City to accept \$600,000 from Nassau County toward the cost of renovations and expansion of the Fernandina Beach Branch of the Nassau County Library in exchange for a 20-year lease of the building to the County.

NOW, THEREFORE, BE IT RESOLVED BY THE CITY COMMISSION OF THE CITY OF FERNANDINA BEACH, FLORIDA, THAT:

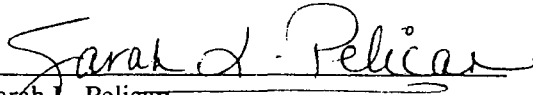
SECTION 1. The City Commission hereby approves the Interlocal Agreement with Nassau County attached hereto as Exhibit "A".

SECTION 2. The Mayor and City Clerk Pro Tem are hereby authorized to execute the Interlocal Agreement upon review and approval of the City Attorney.

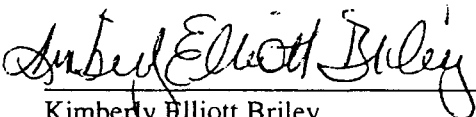
SECTION 3. This Resolution shall become effective immediately upon passage.

ADOPTED this 19th day of November, 2013.

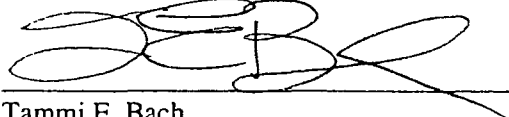
CITY OF FERNANDINA BEACH


Sarah L. Pelican
Commissioner - Mayor

ATTEST:


Kimberly Elliott Briley
City Clerk Pro Tem

APPROVED AS TO FORM AND LEGALITY:


Tammi E. Bach
City Attorney

Rs. 2013-165
Exhibit "A"**INTERLOCAL AGREEMENT**

THIS AGREEMENT made and entered into this 19th day of November, 2013, by and between the Board of County Commissioners of Nassau County, Florida, a political subdivision of the State of Florida (hereinafter referred to as "County"), and the City of Fernandina Beach, a Florida municipality (hereinafter referred to as "City"). County and City are herein collectively referred to as "the Parties".

RECITALS

WHEREAS, the City desires to renovate the structure which houses the Nassau County Public Library, Fernandina Beach Branch, at 25 North 4th Street, Fernandina Beach, Florida; and

WHEREAS, the County desires a larger space in which to conduct its downtown Fernandina Beach library services; and

WHEREAS, the City has chosen construction contractor, Marand Builders, Inc., as the lowest qualified bidder to renovate the existing building and expand on the current site by building an addition of approximately 5,500 square feet in the north side parking lot with additional space of approximately 1,500 square feet being rendered by closing in the atrium and butterfly garden and reconfiguring the existing structure "the Project". These changes will nearly double the existing space of the facility; and

WHEREAS, the lowest qualified bid from Marand Builders, Inc. including bid alternatives brings the cost of the Project to \$1,460,377.00 dollars; and

WHEREAS, the County provides free library services to the public in the City of

Fernandina Beach ; and

WHEREAS, the County enters into this Agreement with the City of Fernandina Beach pursuant to Section 125.01, F.S.; and

WHEREAS, the Project planned at the Fernandina Beach Branch of the Nassau County Public Library System will be in the best interest of the citizens of the City of Fernandina Beach and Nassau County, Florida; and

WHEREAS, the Board of County Commissioners of Nassau County, Florida, authorizes the commitment of funds in the amount of \$600,000.00 toward the Project; and

WHEREAS, the City of Fernandina Beach, authorizes the commitment of funds in the amount of \$600,000.00, and such other and additional funds required to complete the Project; and

WHEREAS, the Friends of Nassau County Library, Inc., not a party to this Interlocal Agreement, has pledged the amount of \$400,000; and

WHEREAS, the Parties wish to cooperate to complete the Project which includes the expansion and renovation of the Fernandina Beach Branch of the Nassau County Public Library System; and

WHEREAS, it is the purpose of this Agreement to set forth clearly the understanding and agreement of the Parties with respect to the foregoing matters.

NOW, THEREFORE, for and in consideration of the mutual promises and covenants and other good and valuable considerations contained herein to be kept the Parties do hereby agree as follows:

SECTION 1.

RESPONSIBILITIES OF THE PARTIES

- 1.1 **Covenant to Budget.** The County does hereby irrevocably covenant to budget from non-ad valorem funds the amount of \$600,000 toward the Project. The City does hereby irrevocably covenant to budget all such additional funds and monies needed and required to complete the Project.

- 1.2 **Nassau County.** The obligations of Nassau County under this agreement shall be limited to the commitment of funds in the amount of \$600,000.00 in Fiscal Year 2013-2014 and following years, if necessary, but in total not exceeding \$600,000. The appropriations necessary for the funding of this Agreement shall not be pledged from ad-valorem funding sources of the Board of County Commissioners of Nassau County, Florida.

- 1.3 **City of Fernandina Beach.** The City of Fernandina Beach commits such funds necessary to complete the Project, including any cost overruns or increases, in Fiscal Year 2013-14, and following years, if necessary. The appropriations necessary for funding of the City's obligations shall not be pledged from ad-valorem sources of the City of Fernandina Beach, Florida. The Parties agree that the City Manager of the City shall supervise construction as Project Manager and shall report to the County at least every other month of progress, particularly

the status of expended funds and the sufficiency of remaining funds to complete the Project.

- 1.4 **The Project.** The Project is a construction project of the City of Fernandina Beach, and is not a joint public works project. The Project is for construction of the building described in Exhibit "A" to this Interlocal Agreement and may not be modified in any material manner without permission of the County. The Project shall include all three additive components bid by the City. The County has relied, as a condition of its financial contribution and other consideration, upon the City's representation that the Project will be constructed in accordance with Exhibit "A".

The City agrees to include in its contract with its architect and its contractor the following language: "Architect / Contractor agrees that it shall look only to the City of Fernandina Beach, Florida for payment, and that it is not a third party beneficiary or in any manner otherwise a beneficiary of the Interlocal Agreement between the City of Fernandina Beach and Nassau County, Florida regarding payment of invoices on this project. Contractor, for good and valuable consideration contained in this agreement does hereby irrevocably waive any right it might claim to seek payment from Nassau County, Florida for work performed on this project."

- 1.5 **Invoicing.** Nassau County shall remit to the City Thirty-Seven and One Half Percent (37.5%) of every invoice, until the County's total contribution equals \$600,000, presented to the City from VRL Architects for design work on the

Project and from Marand Builders, Inc. for the Project, based upon satisfactory documentation of invoiced charges presented by City to County. The County shall make payment to the City in accordance with Chapter 218, Part VII, Florida Statutes (Local Government Prompt Payment Act) upon receipt of satisfactory documentation of invoiced charges.

1.6 The City agrees to lease to Nassau County the building known as the Nassau County Public Library, Fernandina Beach Branch, located at 25 North 4th Street, Fernandina Beach, Florida upon completion of the Project to be used solely as a public library, in consideration of the County's payment of \$600,000 contemplated herein, as rent. As a condition of the County's responsibility to make payment under this Interlocal Agreement, the City shall, at the time of its execution of this Interlocal Agreement approve, execute and sign the lease attached hereto as Exhibit "B".

1.7 The City agrees to continue to assume 100% of ownership and maintenance costs for the building and improvements located at 25 North 4th Street, Fernandina Beach, Florida during construction and upon completion of the Project and for the duration of the lease.

SECTION 2.

MISCELLANEOUS PROVISIONS

2.1 **Incorporation.** The above recitals are true and are incorporated herein by reference. The Exhibits attached hereto are also incorporated herein by reference.

- 2.2 **Term.** This Agreement shall commence on the date first given above. If substantial construction, as determined by the City Manager of the City of Fernandina Beach, has not commenced within two (2) years of the effective date of this Agreement, this Agreement may be terminated by any Party, which termination shall have the effect of terminating the lease as well.
- 2.3 **Entire Agreement; Amendment.** This Agreement embodies the entire agreement between the Parties. There are no promises, terms or conditions, other than those contained herein, that have been agreed to between the Parties. No agent, employee, or other representative of the Parties is empowered to alter the terms of this agreement, unless done in writing and executed by all of the Parties hereto with the same formality as this Agreement. There are no Parties to this Interlocal Agreement other than the City and the County.
- 2.4 **Governing Law/Venue.** This Agreement is made in Nassau County and shall be governed by the laws of the State of Florida. Venue for any action brought in State court shall be in Nassau County, Florida.
- 2.5 **Public Record.** All documents created pursuant to this Agreement are public records and the Parties agree by the Florida law governing public records with regard to this Agreement.
- 2.6 **Assignment.** This Agreement will not be assigned by either Party except with the prior written consent of the other Party.
- 2.7 **Representations and Warranties.** Each Party to this Agreement represents and warrants to the other Party that all appropriate authority exists as to duly

authorize the persons executing this Agreement to so execute the same and fully bind the Party on whose behalf they are executing.

2.8 **Severability.** If one or more of the provisions of this Agreement shall be held to be invalid, illegal or unenforceable in any respect, the validity, legality and enforceability of the remaining provisions hereof shall not in any way be affected or impaired thereby.

2.9 **Sovereign Immunity.** Nothing in this Agreement shall waive or diminish a Party's sovereign immunity as established by the Florida Constitution and State statutes.

2.10 **Notice.** Any notice required to be given or documents required to be delivered by the terms of this Agreement shall be deemed properly given or delivered if hand delivered, or if mailed to the proper Party or Parties by United States Mail, return receipt requested, at the following addresses:

CITY:

City Manager
204 Ash Street
Fernandina Beach, FL 32034

COUNTY:

County Manager
96135 Nassau Place, Suite 1
Yulee, Florida 32097


2.11 **Time is of the Essence.** Time is of the essence in the performance of any of the obligations or covenants as herein contained.

2.12 **Indemnification.** The City and County do not assume any liability for the acts, omissions or negligence of the other Party. Each Party shall indemnify and hold the other harmless from all claims, damages, losses and expenses arising out of or resulting from performance of their respective duties under this Agreement.

Nothing contained herein shall constitute a waiver of immunity or limitation of liability the City or County may have under the doctrine of sovereign immunity or Section 768.28, Florida Statutes.

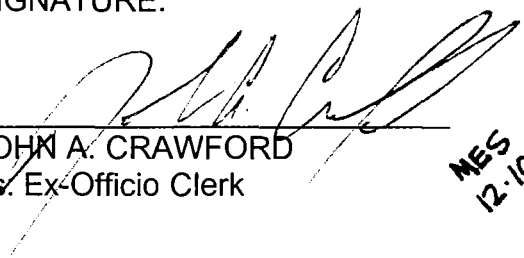
IN WITNESS WHEREOF, the Parties hereto have executed this Interlocal Agreement on the dates set forth in their signature elements and this Agreement shall be dated on the last date that one of the Parties has executed this Agreement.

BOARD OF COUNTY COMMISSIONERS
NASSAU COUNTY, FLORIDA



DANIEL B. LEEPER
Its: Chairman

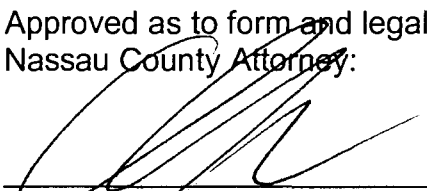
ATTEST AS TO CHAIRMAN'S
SIGNATURE:



JOHN A. CRAWFORD
Its: Ex-Officio Clerk

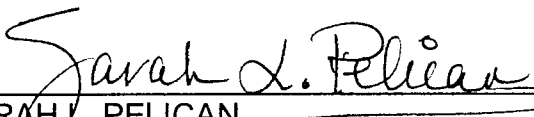
MES
12-10-13

Approved as to form and legality by the
Nassau County Attorney:



DAVID A. HALLMAN

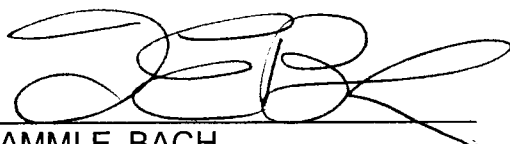
CITY OF FERNANDINA BEACH, FLORIDA


SARAH L. PELICAN
Its: Mayor

ATTEST:


KIMBERLY ELLIOTT BRILEY
Its: City Clerk Pro Tem

Approved as to Form and Legality:


TAMMI E. BACH
Its: City Attorney

CITY OF FERNANDINA BEACH
BID/ PROPOSAL/QUALIFICATION ISSUANCE REQUEST

Please complete the following request form and forward it with a complete copy of your specifications to the Controller's office for processing. Missing information may delay the processing of your request. Thank You.

Department: City Manager's Office Date: 6-14-13
Type (check one) Bid X RFP RFQ Vendor Category # (required): 455-710
Number (assigned by Controller's office): 13-05
Title: Fernandina Beach Branch Library Demolition, Renovation, Addition and Related Site Work

Scope of work attached? Y X N
Account Number to charge advertisement to: 001-7100-572-5200
Person(s) Attending Bid Opening: Marshall McCrary or Joe Gerrity and VRL Architects, Inc.

Public Entity Crime Statement included in the attached specifications (Required)?
Is this a construction project? Yes X No (If yes, refer to Florida Statute 255.0525)
If yes, approximate or budget amount: \$ 1,200,000.00
Performance Bond: Required and included in specs? Y X N
Warranty: Required and included in specs? Y X N
Permitting: Required and included in specs? Y X N

Is this a request for consulting services? Yes No X (If yes, refer to Florida Statute 287.055)
If yes, this must be a Request for Qualifications (RFQ)

ADDITIONAL VENDORS? YES X NO (If yes, please attach list)

Department Director Signature Joe Gerrity Date 7-11-13

Received by Controller's Office for Processing P McCafford Date 7/12/13

DATES:

Publication Date: 7/24/2013 Pre-Bid Meeting Date: 8/6/2013
Posted City Website Date: 7/24/2013 Posted Onvia Demandstar Date: 7/24/2013
Opening Date: 8/23/2013 City Commission Agenda Date: 9/17/2013

Controller Approval Signature P McCafford Date 7/12/13

City Attorney Approval Signature [Signature] Date 7/12/13

City Manager Approval Signature Joe Gerrity Date 7-11-13

EXHIBIT "A"

LEGAL ADVERTISEMENT



INVITATION TO BID

The City of Fernandina Beach will receive sealed competitive Bids for requirements of the following until no later than 2:00 pm, August 23th, 2013.

**BID # 13-05 FERNANDINA BEACH BRANCH LIBRARY EXPANSION AND
RENOVATION PROJECT**

Bid Documents and Specifications are available to download from the City of Fernandina Beach website, www.fbfl.us/bids. Questions regarding bid can be directed in writing to Marshall McCrary, Deputy City Manager, at dmccrary@fbfl.org.

CITY OF FERNANDINA BEACH
204 ASH STREET
FERNANDINA BEACH, FL 32034

EXHIBIT "A"

CITY OF FERNANDINA BEACH, FLORIDA
INVITATION TO BID
#13-05

The City of Fernandina Beach, Florida is accepting competitive sealed bids for the **Fernandina Beach Branch Library Expansion and Renovation.**

The City will receive sealed bids at the location stated below no later than 2pm, Friday, August 23, 2013.

All interested bidders are required to attend a **mandatory** pre-bid meeting to be held at the **CITY HALL COMMISSION CHAMBERS, 204 ASH STREET, FERNANDINA BEACH, FLORIDA** at 11am, Tuesday, August 6, 2013. Failure to attend the pre-bid meeting will result in bid rejection.

Any submittal received after the above stated time and date will not be considered. It shall be the sole responsibility of the Bidder to have its Bid delivered to the City of Fernandina Beach, by U.S. Mail, hand delivery or any other method available to him/her; however, facsimile or telegraphic submittals will not be accepted. Delay in delivery shall be the sole responsibility of the Bidder. Submittals received after the deadline will not be considered. Award of the Bid is subject to authorization and appropriation of funds in the fiscal year 2013-2014 budget.

BIDDERS ARE REFERRED TO THE ATTACHED GENERAL CONDITIONS OF INVITATION TO BID FOR OTHER IMPORTANT INFORMATION REGARDING THE ITB AND BID PROCESS.

The original bid submittal **3 copies (1 Original, 2 Copies)** must be delivered to City Hall in a sealed package, clearly marked on the outside, **ITB # 13-05** and addressed to:

City of Fernandina Beach
Attn: City Clerk's Office – **ITB #13-05** Submittal
204 Ash Street
Fernandina Beach, FL 32034

Hand delivered Submittal is to be taken to the Clerk's Office at the above address.

The bid shall be submitted on the specified Bid Form **3 copies (1 Original, 2 Copies)** hereto attached as "Exhibit A". The person signing the Bid Response Form shall have the authority to bind the proposer to the Bid. All information on the Bid form shall be provided, or the Bid may not be accepted.

The competitive sealed Bid shall be accompanied by a "Public Entity Crimes Statement" herein provided as "Exhibit B", a "Drug Free Workplace Certification", herein provided as "Exhibit C", and an "E-Verify Statement," herein provided as "Exhibit D".

SCOPE OF SERVICES

As per the Project Manual and drawings provided by VRL Architects, Inc., the work shall include furnishing all labor, materials and equipment for the proper execution of demolition, renovations, additions, HVAC, Fire Sprinkler System and related site work to the Fernandina Beach Branch of the Nassau County Public Library located at 25 North 4th Street, Fernandina Beach, Florida. The work includes, but is not limited to, the following:

- 1) Demolition and removal of selected structures, walks, paving and other materials.
- 2) Selective demolition and remodeling work.
- 3) Addition construction and renovate the following areas, complete including operational mechanical and electrical work, finishes, and fire sprinkler system:
 - a) New addition to existing library building.
 - b) Renovation in various areas of the existing building.
 - c) New HVAC, fire alarm, lighting, electrical, plumbing, fire sprinkler system.
 - d) Related site work.
- 4) Plumbing: Alter existing system and add new construction, keeping existing in operation.
- 5) HVAC: Replace existing system with new construction.
- 6) Electrical power and Lighting: Replace existing system with new construction.
- 7) Fire Suppression Sprinklers: Provide new Fire Sprinkler System to both existing and new construction areas.
- 8) Fire Alarm: Replace existing system with new construction.
- 9) Telephone and Data: Provide raceways for owner provided systems; keep existing systems in operation.
- 10) Removal and delivery of specific existing items to City of Fernandina Beach, Florida prior to start of work.

Additive Alternate Bid Item 1: Technology area in existing courtyard.

Additive Alternate Bid Item 2: Replacement of six (6) large windows on east side of existing building.

Additive Alternate Bid Item 3: Demolish and replace the river rock sidewalk sections within the project site to match the stamped concrete sidewalk specified elsewhere within the project site.

TIMELINE

QUALIFICATIONS

Bidders must submit with the Bid Proposal evidence of capabilities to complete the **Fernandina Beach Branch Library Expansion and Renovation**. This will include a list of similar projects (scope and size) successfully completed in the past, a reference list, an equipment list, a list of subcontractors, and other information requested by the City of Fernandina Beach. *Failure to submit qualification information with the Bid Proposal may result in rejection of a Bid.* Successful Bidder is required to have a Business License in the jurisdiction where their home office is located and a Florida Contractor's License in accordance with Chapter 489 Florida Statutes.

INSURANCE REQUIREMENTS

Insurance requirements are outlined in the General Conditions of this Invitation to Bid.

BOND REQUIREMENTS

Bond requirements are outlined in the General Conditions of this Invitation to Bid.

AWARD

Bids shall be priced as a lump sum amount for the Base Bid and the two (2) Additive Alternates. Award recommendation shall be made based on price, ability to meet the time line, and qualifications.

Firms are hereby put on notice that no contact shall be made with any of the City Commission members, City staff, or others that may be involved in the selection process to discuss this request or to influence the outcome of the selection.

CONTACT

All questions and/or requests for information are to be directed *in writing only* to Marshall McCrary, Deputy City Manager, at dmccrary@fbfl.org.

ADDENDA

A written response to bidder questions will be issued via Addendum and posted on the City's website at www.fbfl.us/bids. It is the bidder's responsibility to check the City's website for Addenda prior to submitting their bid. **The deadline for questions is 5pm on Wednesday, August 14, 2013.**

BIDDER SHALL SIGNIFY RECEIPT OF ADDENDA (IF ANY). Failure to Acknowledge Receipt of any Addendum may result in rejection of the bid.

GENERAL CONDITIONS OF INVITATION TO BID

**** FOR CONSTRUCTION SERVICES ****

ITB #13-05

1. PREPARATION OF BID

- a. INVITATION TO BID shall be prepared in accordance with the following:
- b. The enclosed Bid Form, attached hereto as "Exhibit A", shall be used when submitting your INVITATION TO BID.
- c. All information required by the Bid Form shall be furnished. The Bidder shall print or type his/her name and manually sign the Form and any continuation sheet on which an entry is made.
- d. Unit prices shall be shown and where there is an error in extension of price, the unit price shall govern.
- e. Alternate Bids will not be considered unless authorized by the Invitation to Bid.
- f. Bidders will not include federal taxes nor State of Florida sales, excise, and use taxes in prices, as the City is exempt from payment of such taxes. An exemption certificate will be signed where applicable upon request.
- g. Bidders shall make all investigations necessary to thoroughly inform themselves about any and all conditions related to the performance of the contract. Plea of ignorance by the Bidder of conditions that exists or may hereafter exist as a result of failure or omission on the part of the Bidder to make the necessary examinations and investigations, or failure to fulfill in every detail the requirements provided for in the Purchasing Policy, Purchasing Ordinance and/or State and Federal Statutes. The City's Purchasing Ordinance is set forth in Chapter 2-420, *et seq.*
- h. Prices quoted must be FOB City of Fernandina Beach, Florida with all transportation charges prepaid unless otherwise specified in the Invitation to Bid.
- i. Deliveries are to be FOB Destination unless otherwise specified in the Invitation to Bid.
- j. Deliveries are to be made during regular business hours.
- k. Bids and Bid prices shall be valid for a minimum of sixty (60) days, unless otherwise stated on the INVITATION TO BID.

2. SUBMISSION OF BIDS

- a. Bids and changes thereto shall be enclosed in sealed envelopes & addressed as instructed on the Bid Form. The name and address of the Bidder, the date and hour of the Invitation to Bid opening and the material or service shall be placed on the outside of the envelope.
- b. INVITATION TO BID must be submitted on the forms furnished. Telegraphic Bids will not be considered.

3. REJECTION OF BIDS

- a. The City reserves the right to accept or reject any or all Bids, to waive irregularities and technicalities, and to request resubmission or to re-advertise for the services. The City shall be the sole judge of the submittals. The City's decision shall be final.

4. WITHDRAWAL OF BIDS

- a. Bids may not be withdrawn after the time set for the opening for a period of time as specified.
- b. Bids may be withdrawn prior to the time set for the opening. Such request must be in writing.

5. LATE BIDS

- a. INVITATION TO BID and modifications received after the time set for the opening will not be considered.
- b. Modifications in writing received prior to the time set for the opening will be accepted.

6. LOCAL, STATE, AND FEDERAL COMPLIANCE

- a. Bidders shall comply with all local, state, and federal directives, orders and laws as applicable to the INVITATION TO BID and subsequent contract(s) including but not limited to Equal Employment Opportunity (EEO), Minority Business Enterprise (MBE), and OSHA as applicable to this contract.
- b. A "Public Entity Crimes Statement", in accordance with Florida Statutes, Section 287.133 (3) (a), on Public Entity Crimes, attached hereto as Exhibit "B", must be received at the time of the bid.
- c. A "Drug Free Workplace Certification" attached hereto as Exhibit "C", must be received at the time of the bid.
- d. The City of Fernandina Beach requires that the Bidder selected will not discriminate under the contract against any person, in accordance with federal, state and local government regulations.

7. COLLUSION

- a. The Bidder, by affixing his signature to the Bid Form, agrees to the following:
"Bidder certifies that his INVITATION TO BID is made without previous understanding, agreement, or connection with any person, firm or corporation making a Bid for the same item(s) and is in all respects fair, without outside control, collusion, fraud, or otherwise illegal action".

8. AWARD OF INVITATION TO BID

- a. The INVITATION TO BID will be awarded to the qualified supplier with the best value Bid whose Bid, conforming to the INVITATION TO BID, is most advantageous to the City of Fernandina Beach, price and other factors considered.
- b. The City reserves the right to accept and award item by item, and/or by group, or in the aggregate.
- c. A written award of acceptance (Purchase Order), mailed or otherwise furnished to the successful Bidder shall result in a binding contract without further action by either party.
- d. Unless otherwise noted in the specifications, the length of the agreement shall be one year, with 2 one year renewals possible based on the mutual consent of the parties.

9. NOT RESPONSIBLE FOR COSTS

- a. The City shall not be responsible for any cost incurred by a prospective Bidder in responding to this INVITATION TO BID.

10. BONDS

- a. **BID BOND:** A certified check or Bid Bond shall accompany each Bid. The certified check or Bid Bond shall be for an amount not less than five percent (5%) of the Bid price and shall be made payable to the OWNER as a guarantee that the Bidder will not withdraw its bid for a period of ninety (90) calendar days after Bid closing time.
- b. **PERFORMANCE AND PAYMENT BONDS:** In the event the Contract is awarded to the Bidder, Bidder will thereafter enter into a written contract with the OWNER and furnish a Payment and Performance Bond in an amount equal to the contract price, in strict accordance with Section 255.05 of Florida Statutes. Failing to do so, Bidder will forfeit its bid security. Payment and Performance Bond shall be secured from or countersigned by an agency or surety company recognized in good standing and authorized to do business in the State of Florida.

11. PUBLIC INFORMATION

- a. All information contained in this Bid is public information, and as such will be handled in accordance with the Florida Statutes.

12. ADDITIONAL INFORMATION

- a. The City reserves the right to require Bidders to provide references and information on previous similar experience prior to award of the contract.

13. PAYMENT

- a. Payment will be made in accordance with the Florida Prompt Payment Act.

14. BIDDER QUESTIONS

- a. Bidder questions during the bid period shall be submitted in writing to the City of Fernandina Beach via e-mailed to Marshall McCrary, Deputy City Manager, at dmcrary@fbfl.org.

15. MANDATORY PRE-BID CONFERENCE

- a. All bidders are required to attend a **mandatory** pre-bid conference to be held at the Fernandina Beach City Hall at 204 Ash Street, Fernandina Beach, FL at **11am on Tuesday, August 6, 2013**. Failure to attend the pre-bid conference will cause bid rejection.

16. INDEMNIFICATION AND INSURANCE AND PAYMENT

- a. **INDEMNIFICATION:** The parties recognize that the Contractor is an independent contractor. The Contractor agrees to assume liability for and indemnify, hold harmless, and defend the City, its commissioners, mayor, officers, employees, agents, and attorneys of, from, and against all liability and expense, including reasonable attorney's fees, in connection with any and all claims, demands, damages, actions, causes of action, and suits in equity of whatever kind or nature, including claims for personal injury, property damage, equitable relief, or loss of use, to the extent caused by the negligence, recklessness, or intentionally wrongful conduct of the Contractor, its agents, officers, contractors, subcontractors, employees, or anyone else utilized by the Contractor in the performance of this Agreement. The Contractor's liability hereunder shall include all attorney's fees and costs incurred by the City in the enforcement of this indemnification

provision. This includes claims made by the employees of the Contractor against the City and the Contractor hereby waives its entitlement, if any, to immunity under Section 440.11, Florida Statutes. Such obligations contained in this provision shall survive termination of this Agreement and shall not be limited by the amount of any insurance required to be obtained or maintained under this Agreement.

Subject to the limitations set forth in this Section, Contractor shall assume control of the defense of any claim asserted by a third party against the City and, in connection with such defense, shall appoint lead counsel, in each case at the Contractor's expense. The City shall have the right, at its option, to participate in the defense of any third party claim, without relieving Contractor of any of its obligations hereunder. If the Contractor assumes control of the defense of any third party claim in accordance with this paragraph, the Contractor shall obtain the prior written consent of the City before entering into any settlement of such claim. Notwithstanding anything to the contrary in this Section, the Contractor shall not assume or maintain control of the defense of any third party claim, but shall pay the fees of counsel retained by the City and all expenses, including experts' fees, if (i) an adverse determination with respect to the third party claim would, in the good faith judgment of the City, be detrimental in any material respect to the City's reputation; (ii) the third party claim seeks an injunction or equitable relief against the City; or (iii) the Contractor has failed or is failing to prosecute or defend vigorously the third party claim. Each party shall cooperate, and cause its agents to cooperate, in the defense or prosecution of any third party claim and shall furnish or cause to be furnished such records and information, and attend such conferences, discovery proceedings, hearings, trials, or appeals, as may be reasonably requested in connection therewith. It is further the specific intent and agreement of said parties that all the Contract Documents on this Project are hereby amended to include the foregoing indemnification. CONTRACTOR expressly agrees that it will not claim, and waives any claim, that this indemnification violates Section 725.06, Florida Statutes or is unenforceable pursuant to Section 725.06, Florida Statutes.

Nothing contained in the foregoing indemnification shall be construed to be a waiver of any immunity or limitation of liability the CITY may have under the doctrine of sovereign immunity or Section 768.28, Florida Statutes.

b. INSURANCE:

(1) Certificate of Insurance

The CITY shall be furnished proof of insurance coverage as follows:

- The name of the insured, the name of the insurer, the number of the policy, its effective date, and its termination date;
- Statement that the insurer will mail notice to the CITY and a copy to CONTRACTOR at least thirty (30) days prior to any material changes in provisions, cancellation, renewal, or non-renewal of the policy;
- Certificate of Insurance shall be in the form as approved by the CITY, naming the CITY as additional insured, and such Certificate shall clearly state all the coverage required in this Section;
- If requested by the CITY, CONTRACTOR shall furnish complete copies of all insurance policies, forms and endorsements; and
- Receipt of certificates or other documentation of insurance or policies or copies of policies by the CITY or by any of its representatives which indicate less

EXHIBIT "A"

coverage than required by this agreement does not constitute a waiver of CONTRACTORS obligations to fulfill the requirements of this Section.

(2) Workers' Compensation Insurance

CONTRACTOR shall have in full force, during the life of this agreement, Workers' Compensation and Employer's Liability Insurance for all its employees connected with work under this agreement, and in the event any work is subcontracted, CONTRACTOR shall require the subcontract similarly to provide Workers' Compensation Insurance for all of the latter's employees, unless such employees are covered by the protection afforded by CONTRACTOR. CONTRACTOR may provide a workers' compensation waiver in lieu of workers' compensation insurance where such waiver is properly approved by the Florida Department of Labor and Employment Security and accepted by the CITY in writing. Such insurance or waiver shall comply with the Florida Workers' Compensation Law. In case any class of work conducted under this agreement is not protected under the Workers' Compensation statute, CONTRACTOR shall provide adequate insurance, satisfactory to the CITY, for the protection of employees not otherwise protected.

(3) Liability Insurance

CONTRACTOR shall have in full force, during the life of this agreement, Commercial General Liability and Commercial Automobile Liability Insurance that shall protect the CITY from claims for damage for bodily injury and personal injury, including accidental death, as well as claims for property damages which may arise from tasks associated with or carried out under this agreement, whether such operations are by itself or by anyone directly or indirectly employed by them, and the amount of such insurance shall be minimum limits as follows:

Commercial General Liability:

- Minimum Coverage is \$1,000,000 per occurrence.
- Coverage shall include premises, operations, products, completed operations, independent contractors, contractual liability covering this agreement, contracts and leases, broad form property damage coverage, personal injury and bodily injury.
- If Umbrella or Excess liability coverage is used to satisfy the requirements of this Article, it shall not be more restrictive than the underlying insurance policy coverage.

Commercial Automobile Liability:

- Minimum Coverage is \$1,000,000 per occurrence.
- Coverage shall include bodily injury and property damage arising out of ownership, maintenance or use of any auto, including owned, non-owned and hired automobiles and employee non-ownership use.

- c. **PAYMENT:** Payment due hereunder shall be made by the CITY to CONTRACTOR/VENDOR in accordance with the Florida Prompt Payment Act.

EXHIBIT "A"

BID FORM

CITY OF FERNANDINA BEACH ITB # 13-05

FERNANDINA BEACH BRANCH LIBRARY EXPANSION AND RENOVATION

I hereby submit the following Base Bid for _____.
Price is in accordance with the Specifications and the General Conditions of the ITB as provided.

Base Bid Amount: \$ _____

Additive Alternate Bid Item 1: Technology area in existing courtyard.

Additive Alternate Bid Item 1 Amount: \$ _____

Additive Alternate Bid Item 2: Replacement of six (6) large windows on east side of existing building.

Additive Alternate Bid Item 2 Amount: \$ _____

Additive Alternate Bid Item 3: Demolish and replace the river rock sidewalk sections within the project site to match the stamped concrete sidewalk specified elsewhere within the project site.

Additive Alternate Bid Item 3 Amount: \$ _____

Name: _____

Federal Taxpayer ID: _____

Mailing Address: _____

City, State, & Zip Code: _____

Telephone: _____ Fax: _____

Submitted By: _____

Title: _____

Remarks: _____

IF NOT SUMITTING A BID, IN ORDER TO REMAIN ACTIVE IN OUR BID VENDOR RECORDS, PLEASE COMPLETE THIS FORM MARKED "NO SUBMITTAL" WITH THE REASON, AND FAX TO (904) 277-7317.

EXHIBIT "B"

TO GENERAL CONDITIONS TO ITB # 13-05

CITY OF FERNANDINA BEACH, FLORIDA SWORN STATEMENT UNDER F.S.
SECTION 287.133(3)(A), ON PUBLIC ENTITY CRIMES

**THIS FORM MUST BE SIGNED IN THE PRESENCE OF A NOTARY PUBLIC OR
OTHER OFFICER AUTHORIZED TO ADMINISTER OATHS.**

1. This sworn statement is submitted with Bid, Proposal or Contract for _____.
2. This sworn statement is submitted by (entity) _____ whose business address is _____ and (if applicable) Federal Employer Identification Number (FEIN) is _____ (If the entity has no FEIN, include the Social Security Number of the individual signing this sworn statement: _____.)
3. My name is _____ and my relationship to the entity named above is _____.
4. I understand that a "public entity crime" as defined in Paragraph 287.133(a)(g), Florida Statutes, means a violation of any state or federal law by a person with respect to and directly related to the transaction of business with any public entity or with an agency or political subdivision of any other state or with the United States, including, but not limited to, any bid or contract for goods or services to be provided to any public entity or any agency or political subdivision of any other state or of the United States and involving antitrust, fraud, theft, bribery, collusion, racketeering, conspiracy, or material misrepresentation.
5. I understand that "convicted" or "conviction" as defined in paragraph 287.133(a)(b), Florida Statutes, means finding of guilt or a conviction of a public entity crime with or without an adjudication of guilt, in any federal or state trial court of records relating to charges brought by indictment or information after July 1, 1989, as a result of a jury verdict, non-jury trial, or entry of a plea of guilty or nolo contendere.
6. I understand that an "affiliate" as defined in Paragraph 287.133(1)(a), Florida Statutes, means:
 1. A predecessor or successor of a person convicted of a public entity crime; or
 2. An entity under the control of any natural person who is active in the management of the entity and who has been convicted of a public entity crime. The term "affiliate" includes those officers, directors, executives, partners, shareholders, employees, members, and agents who are active in the management of an affiliate. The City of Fernandina Beach, Florida ownership by one of shares constituting a controlling income among persons when not for fair interest in another person, or a pooling of equipment or income among persons when not for fair market value under a length agreement, shall be a prima facie case that one person controls another person. A person who was knowingly convicted of a public entity crime, in Florida during the preceding 36 months shall be considered an affiliate.

EXHIBIT "A"

7. I understand that a "person" as defined in Paragraph 287.133(1)(e), Florida Statutes, means any natural person or entity organized under the laws of the state or of the United States with the legal power to enter into a binding contract for provision of goods or services let by a public entity, or which otherwise transacts or applies to transact business with a public entity. The term "person" includes those officers, directors, executives, partners, shareholders, employees, members, and agents who are active n management of an entity.

8. Based on information and belief, the statement which I have marked below is true in relation to the entity submitting this sworn statement. (Please indicate which statement applies)

_____ Neither the entity submitting this sworn statement, nor any officers, directors, executives, partners, shareholders, employees, members, or agents who are active in management of the entity, nor affiliate of the entity have been charged with and convicted of a public entity crime subsequent to July 1, 1989.

_____ The entity submitting this sworn statement, or one or more of the officers, directors, executives, partners, shareholders, employees, members, or agents who are active in management of the entity, or an affiliate of the entity has been charged with and convicted of a public entity crime subsequent to July 1, 1989. (Please attach a copy of the final order.)

_____ The person or affiliate was placed on the convicted vendor list. There has been a subsequent proceeding before a hearing officer of the State of Florida, Division of Administrative Hearings. The final order entered by the hearing officer determined that it was in public interest to remove the person or affiliate from the convicted vendor list. (Please attach a copy of the final order.)

_____ The person or affiliate has not been placed on the convicted vendor list. (Please describe any action taken by, or pending with, the Department of General Services.)

Signature

Date:

STATE OF FLORIDA
COUNTY OF _____

PERSONALLY APPEARED BEFORE ME, the undersigned authority, who, after first being sworn by me, affixed his/her signature at the space provided above on this ___ day of _____, 200 ____, and is personally known to me, or has provided _____ as identification.

Notary Public

My Commission expires:

EXHIBIT "C"

TO GENERAL CONDITIONS TO ITB # 13-05
CITY OF FERNANDINA BEACH

DRUG-FREE WORKPLACE CERTIFICATION

The below-signed Proposer certifies that it has implemented a drug-free workplace program. In order to have a drug-free workplace prepare, a business shall:

1. Publish a statement notifying employees that the unlawful manufacture, distribution, dispensing, possession, or use of a controlled substance is prohibited in the workplace and specifying the actions that will be taken against employees for violation of such prohibition.
2. Inform employees about the dangers of drug abuse in the workplace, the business's policy of maintaining a drug-free workplace, any available drug counseling, rehabilitation, and employee assistance programs, and the penalties that may be imposed upon employees for drug abuse violations.
3. Give each employee engaged in providing the commodities or services a copy of the statement specified in paragraph 1.
4. In the statement in paragraph 1., notify the employees that, as a condition of working on the commodities or contractual services that are under bid, the employee will abide by the terms of the statement and will notify the employer of any conviction of, or plea of nolo contendere to, any violation occurring in the workplace no later than five (5) working days after such conviction.
5. Impose a sanction on, or require fine satisfactory participation in drug abuse assistance or rehabilitation program if such is available in the employee's community, by any employee who is convicted.
6. Make a good faith effort to continue to maintain a drug-free workplace through implementation of this section.

As the person authorized to sign this statement, I Certify that this firm complies fully with the above drug-free workplace requirements.

COMPANY: _____

CITY: _____ STATE: _____ ZIP CODE: _____

TELEPHONE NUMBER(S): _____

SIGNATURE: _____

NAME (TYPED OR PRINTED): _____ TITLE: _____

EXHIBIT "D"
ITB 13-05
CITY OF FERNANDINA BEACH



E-VERIFY STATEMENT

Bid/Proposal Number: _____

Project Description: _____

Vendor/Consultant acknowledges and agrees to the following:

Vendor/Consultant shall utilize the U.S. Department of Homeland Security's E-Verify system, in accordance with the terms governing use of the system, to confirm the employment eligibility of:

1. All persons employed by the Vendor/Consultant during the term of the Contract to perform employment duties within Florida; and
2. All persons, including subcontractors, assigned by the Vendor/Consultant to perform work pursuant to the contract with the Department.

Company/Firm: _____

Authorized Signature: _____

Title: _____

Date: _____



INVITATION TO BID

The City of Fernandina Beach will receive sealed competitive bids for requirements of the following until no later than 2:00 pm, August 23rd, 2013.

BID # 13-05

FERNANDINA BEACH BRANCH LIBRARY EXPANSION AND RENOVATION PROJECT

Bid Documents and Specifications are available to download from the City of Fernandina Beach website, www.fbfl.us/bids. Questions regarding bid can be directed in writing to Marshall McCrary, Deputy City Manager at dmccrary@fbfl.org.

CITY OF FERNANDINA BEACH
204 ASH STREET
FERNANDINA BEACH, FL 32034

is Soup & Salad Bar
lay - Friday \$8.99

FREE Drink
 any Buffet purchase
for up to 4 people!

Any Day Lunch, \$10.99
 12:00pm - 2:00pm
 1000 S. Atlantic Blvd., Palm Bay, FL 32909
 904-321-2430

EXHIBIT 100

BUY ONE, GET ONE FREE
LUNCH OR DINNER

18% Gratuity will be added before discount
 cannot be used with special events or other discount offers Expires 7/31/13

Lunch: Tues. - Fri. 10am-3pm • Dinner: Wed. - Sat. 6pm-9pm
 Palmetto Walk Shops • 4825 First Coast Highway
 904-321-2430 • www.horizonsameliasland.com

STORE HOURS

M-Sat: 9 - 6 | Sun: 12 - 4
 (Atlantic Avenue) M-Sat: 10 - 6
 (Amelia Avenue)



Nassau County Farm Bureau Relocates to Fernandina Beach

We would like to welcome Brad Raulerson as the new agent for our Fernandina Beach office.

Brad has been an agent with Florida Farm Bureau Insurance for over 13 years and has over 17 years of experience in the insurance industry. During that time he has been awarded several distinguished accomplishments for sales and leadership within the Florida Farm Bureau Organization. After spending five years managing offices for the company in South Florida, Brad decided to move back to NE Florida and make Fernandina Beach home. We are pleased to have him join us and welcome his experience and leadership skills.

Brad received his business degree from the University of Florida and has earned two professional designations: Chartered Underwriter (CLU) and the Chartered Advisor for Small Business (CASB). He is currently in the process of completing the Chartered Financial Consultant (ChFC). Brad is a member of the Florida Farm Bureau and the National Association of Farm Bureau Advisors. He has been happily married for 15 years.



1890 S. 1st Street
 Amelia Beach, FL 32034
 (904) 321-2430



Price Fixe Menu All Night LIVE
 with John Springer
 Tuesday & Wednesday Nights

LIVE with Aaron Bing
 Friday & Saturday Nights

Food & Steak House
 private room up to 50 guests
 semi-private room up to 12 guests
Order Mystery Dinner
 August 8th
 comedians performing 3 acts
 \$9.95 pp + tax and grat
 visit our website for menu details

Summer Prix
 Fixe Menu
 2 Courses \$29
 3 Courses \$33

Young Adult Menu Available
 204 Ash Street, Fernandina Beach
 Reservations Suggested
 904-310-6049
www.AmeliaIslandDavids.com



INVITATION TO BID

The City of Fernandina Beach will receive sealed competitive bids for requirements of the following until no later than 2:00 pm, August 23rd, 2013.

BID # 13-05

**FERNANDINA BEACH
 BRANCH LIBRARY EXPANSION
 AND RENOVATION PROJECT**

Bid Documents and Specifications are available to download from the City of Fernandina Beach website, www.fbfl.us/bids. Questions regarding bid can be directed in writing to Marshall McCrary, Deputy City Manager at dmccrary@fbfl.org.

CITY OF FERNANDINA BEACH
 204 ASH STREET
 FERNANDINA BEACH, FL 32034

7/24/2013 ML

RESOLUTION 2013-128

A RESOLUTION OF THE CITY COMMISSION OF THE CITY OF FERNANDINA BEACH, FLORIDA, AUTHORIZING THE AWARD OF BID # 13-05 AND A CONSTRUCTION CONTRACT TO MARAND BUILDERS, INC. FOR THE RENOVATION AND EXPANSION OF THE FERNANDINA BEACH BRANCH LIBRARY; AUTHORIZING EXECUTION; AND PROVIDING FOR AN EFFECTIVE DATE.

WHEREAS, Bid #13-05 for the Fernandina Beach Branch Library Expansion and Renovation project was opened on August 23, 2013, and nine (9) qualified bids were received; and

WHEREAS, Marand Builders, Inc. submitted the lowest qualified Base Bid of \$1,385,974, a Bid Alternate 1 (technology area) bid of \$45,003, a Bid Alternate 2 (window replacement) bid of \$22,250, a Bid Alternate 3 (sidewalk replacement) bid of \$7,150, and the lowest qualified total bid (Base Bid plus Bid Alternates) of \$1,460,377; and

WHEREAS, the project architect recommends awarding the Construction Contract to Marand Builders, Inc.; and

WHEREAS, funds in the amount of \$1,069,000 are available in the Library account # 300-3000-571.6200 in FY 2013/2014, including a \$600,000 commitment for this project from the Nassau County Board of County Commissioners in their FY 2013/14 budget; and

WHEREAS, the Friends of the Library have committed an additional \$400,000 in donations to be used for the project. The contribution from the Friends of the Library is not currently included in the FY 2013/2014 budget, to do so will require the Commission approve a budget amendment in the near future; and

WHEREAS, in order to maintain sufficient contingency funding for this project, Bid Alternates 2 and 3 are to be excluded, resulting in a bid total of \$1,430,977.

NOW, THEREFORE, BE IT RESOLVED BY THE CITY COMMISSION OF THE CITY OF FERNANDINA BEACH, FLORIDA, THAT:

SECTION 1. The City Commission hereby approves the award of Bid #13-05 to Marand Builders, Inc.

SECTION 2. The City Commission authorizes the City Manager to negotiate the Construction Contract with Marand Builders, Inc. in an amount not to exceed \$1,430,977 and authorizes the City Manager and City Clerk to execute said Contract upon review and approval of the City Attorney and only after 1.) the execution of an Inter-Local Agreement between the City of Fernandina Beach and Nassau County acknowledging mutual commitments for funding and 2.) the contributions committed by the Friends of

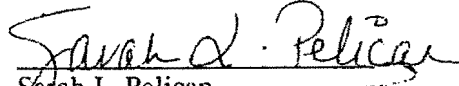
EXHIBIT "A"

the Library are deposited into an escrow account with mutually agreeable terms and conditions.

SECTION 3. This Resolution shall become effective immediately upon passage.

ADOPTED this 17th day of September, 2013.

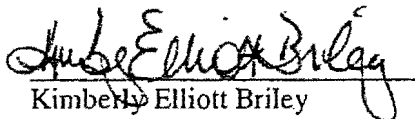
CITY OF FERNANDINA BEACH



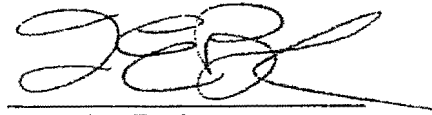
Sarah L. Pelican
Mayor - Commissioner

ATTEST:

APPROVED AS TO FORM AND LEGALITY:



Kimberly Elliott Briley
City Clerk Pro Tem



Tammi E. Bach
City Attorney

CITY OF FERNANDINA BEACH BID OPENING

ITB #13-05 FERNANDINA BEACH BRANCH LIBRARY EXPANSION & RENOVATION
8/23/2013 at 2pm

OPENED BY: MARSHALL McCRARY and ADRIENNE BURKE

DATE/ TIME	COMPANY	LOCATION	EXTS. A,B,C,D	ADD. 1,2,3,4	BASE BID	BID ALT 1	BID ALT 2	BID ALT 3	TOTAL
8/23 1:53PM	ACON CONSTRUCTION CO.	JACKSONVILLE, FL	YES	YES	\$1,684,900.00	\$60,000.00	\$29,500.00	\$5,700.00	\$1,780,100.00
8/23 1:53PM	F&G CONSTRUCTION	JACKSONVILLE, FL	YES	YES	\$1,399,998.00	\$72,000.00	\$24,000.00	\$9,500.00	\$1,505,498.00
8/23 1:54PM	RB GAY CONSTRUCTION CO.	JACKSONVILLE, FL	YES	YES	\$1,514,000.00	\$49,000.00	\$22,000.00	\$8,824.00	\$1,593,824.00
8/23 1:53PM	THOMAS MAY CONSTRUCTION CO.	ORANGE PARK, FL	YES	YES	\$1,538,000.00	\$55,000.00	\$16,000.00	\$7,000.00	\$1,616,000.00
8/23 1:55PM	BUSH CONSTRUCTION CO.	JACKSONVILLE, FL	YES	YES	\$1,468,712.00	\$49,966.00	\$12,075.00	\$5,178.00	\$1,535,931.00
8/23 1:55PM	FLINT CONSTRUCTION SERVICES	ATLANTIC BEACH, FL	YES	YES	\$1,464,000.00	\$59,673.00	\$22,940.00	\$5,950.00	\$1,552,563.00
8/23 1:57PM	CC BORDEN CONSTRUCTION	JACKSONVILLE, FL	YES	YES	\$1,423,570.00	\$48,000.00	\$13,125.00	\$5,250.00	\$1,489,945.00
8/23 1:57PM	CHISM DEVELOPMENT CO.	FERNANDINA BEACH, FL	YES	YES	\$1,950,000.00	\$9,520.00	\$30,126.88	\$13,440.00	\$2,003,086.88
8/23 1:47PM	MARAND BUILDERS	ATLANTIC BEACH, FL	YES	YES	\$1,385,974.00	\$45,003.00	\$22,250.00	\$7,150.00	\$1,460,377.00

EXHIBIT "A"



Architects, Inc.
License #AAC001735

William K. Rinaman, AIA
Stephen F. Lazar, AIA, LEED® AP
Christine R. Hinrichs, AIA.

1000 W. 10th Street
Tallahassee, Florida 32302

Phone 904-723-3895

26 August 2013

City of Fernandina Beach
204 Ash Street
Fernandina Beach, Florida 32034-4230

Attn: Mr. Joe Gerrity, City Manager

Re: Fernandina Beach Library Expansion and Renovation
VRL#1207

Subject: Recommendation of Contract Award

Gentleman:

Having reviewed the Bids received on Friday, 23 August 2013 for the above captioned project, and having reviewed the package submitted by the apparent low bidder, we recommend the award of the Construction Contract to Marand Builders, Inc.

Sincerely,
VRL Architects, Inc.

A handwritten signature in black ink, appearing to read 'Stephen F. Lazar', is written over a horizontal line. The signature is stylized and somewhat cursive.

Stephen F. Lazar, AIA, LEED AP

EXHIBIT "A"

BID FORM

CITY OF FERNANDINA BEACH ITB # 13-05

FERNANDINA BEACH BRANCH LIBRARY EXPANSION AND RENOVATION

I hereby submit the following Base Bid for Fernandina Beach Library Exp. & Renov.. Price is in accordance with the Specifications and the General Conditions of the ITB as provided.

Base Bid Amount: \$ 1,385,974

Additive Alternate Bid Item 1: Technology area in existing courtyard.

Additive Alternate Bid Item 1 Amount: \$ 45,003

Additive Alternate Bid Item 2: Replacement of six (6) large windows on east side of existing building.

Additive Alternate Bid Item 2 Amount: \$ 22,250

Additive Alternate Bid Item 3: Demolish and replace the river rock sidewalk sections within the project site to match the stamped concrete sidewalk specified elsewhere within the project site.

Additive Alternate Bid Item 3 Amount: \$ 7,150

Name: Marand Builders, Inc.

Federal Taxpayer ID: 56-2165021

Mailing Address: 2426 Marand Builders, Inc.

City, State, & Zip Code: Atlantic Beach, FL 32233

Telephone: 904-247-3211 Fax: 904-247-3212

Submitted By: Nathan Hayes

Title: Vice President

Remarks: _____

IF NOT SUMITTING A BID, IN ORDER TO REMAIN ACTIVE IN OUR BID VENDOR RECORDS, PLEASE COMPLETE THIS FORM MARKED "NO SUBMITTAL" WITH THE REASON, AND FAX TO (904) 277-7317.

EXHIBIT "B"
TO GENERAL CONDITIONS TO ITB # 13-05

CITY OF FERNANDINA BEACH, FLORIDA SWORN STATEMENT UNDER F.S.
SECTION 287.133(3)(A), ON PUBLIC ENTITY CRIMES

THIS FORM MUST BE SIGNED IN THE PRESENCE OF A NOTARY PUBLIC OR
OTHER OFFICER AUTHORIZED TO ADMINISTER OATHS.

1. This sworn statement is submitted with Bid, Proposal or Contract for ITB # 13-05.
2. This sworn statement is submitted by (entity) Marand Builders, Inc whose business address is 2426 Mayport Rd., Atl. Bch. FL and (if applicable) Federal Employer Identification Number (FEIN) is 56-2165021 (If the entity has no FEIN, include the Social Security Number of the individual signing this sworn statement: _____.)
3. My name is Nathan Hayes and my relationship to the entity named above is Vice President.
4. I understand that a "public entity crime" as defined in Paragraph 287.133(a)(g), Florida Statutes, means a violation of any state or federal law by a person with respect to and directly related to the transaction of business with any public entity or with an agency or political subdivision of any other state or with the United States, including, but not limited to, any bid or contract for goods or services to be provided to any public entity or any agency or political subdivision of any other state or of the United States and involving antitrust, fraud, theft, bribery, collusion, racketeering, conspiracy, or material misrepresentation.
5. I understand that "convicted" or "conviction" as defined in paragraph 287.133(a)(b), Florida Statutes, means finding of guilt or a conviction of a public entity crime with or without an adjudication of guilt, in any federal or state trial court of records relating to charges brought by indictment or information after July 1, 1989, as a result of a jury verdict, non-jury trial, or entry of a plea of guilty or nolo contendere.
6. I understand that an "affiliate" as defined in Paragraph 287.133(1)(a), Florida Statutes, means:
 1. A predecessor or successor of a person convicted of a public entity crime; or
 2. An entity under the control of any natural person who is active in the management of the entity and who has been convicted of a public entity crime. The term "affiliate" includes those officers, directors, executives, partners, shareholders, employees, members, and agents who are active in the management of an affiliate. The City of Fernandina Beach, Florida ownership by one of shares constituting a controlling income among persons when not for fair interest in another person, or a pooling of equipment or income among persons when not for fair market value under a length agreement, shall be a prima facie case that one person controls another person. A person who was knowingly convicted of a public entity crime in Florida during the preceding 36 months shall be considered an affiliate.

EXHIBIT "A"

7. I understand that a "person" as defined in Paragraph 287.133(1)(e), Florida Statutes, means any natural person or entity organized under the laws of the state or of the United States with the legal power to enter into a binding contract for provision of goods or services let by a public entity, or which otherwise transacts or applies to transact business with a public entity. The term "person" includes those officers, directors, executives, partners, shareholders, employees, members, and agents who are active in management of an entity.

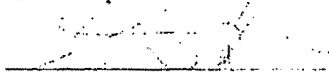
8. Based on information and belief, the statement which I have marked below is true in relation to the entity submitting this sworn statement. (Please indicate which statement applies)

Neither the entity submitting this sworn statement, nor any officers, directors, executives, partners, shareholders, employees, members, or agents who are active in management of the entity, nor affiliate of the entity have been charged with and convicted of a public entity crime subsequent to July 1, 1989.

The entity submitting this sworn statement, or one or more of the officers, directors, executives, partners, shareholders, employees, members, or agents who are active in management of the entity, or an affiliate of the entity has been charged with and convicted of a public entity crime subsequent to July 1, 1989. (Please attach a copy of the final order.)

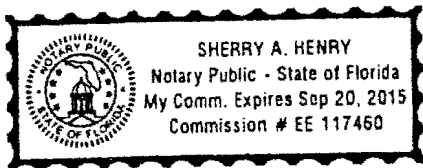
The person or affiliate was placed on the convicted vendor list. There has been a subsequent proceeding before a hearing officer of the State of Florida, Division of Administrative Hearings. The final order entered by the hearing officer determined that it was in public interest to remove the person or affiliate from the convicted vendor list. (Please attach a copy of the final order.)

The person or affiliate has not been placed on the convicted vendor list. (Please describe any action taken by, or pending with, the Department of General Services.)


Signature _____ Date: 8/23/13

STATE OF FLORIDA
COUNTY OF Duval

PERSONALLY APPEARED BEFORE ME, the undersigned authority, who, after first being sworn by me, affixed his/her signature at the space provided above on this 23 day of August, 2008, and is personally known to me, or has provided _____ as identification.



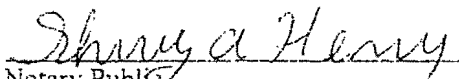

Notary Public
My Commission expires: 9-20-15

EXHIBIT "D"
ITB 13-05
CITY OF FERNANDINA BEACH



E-VERIFY STATEMENT

Bid/Proposal Number: ITB # 13 - 05

Project Description: Fernandina Beach Library Expansion and Renovation

Vendor/Consultant acknowledges and agrees to the following:

Vendor/Consultant shall utilize the U.S. Department of Homeland Security's E-Verify system, in accordance with the terms governing use of the system, to confirm the employment eligibility of:

1. All persons employed by the Vendor/Consultant during the term of the Contract to perform employment duties within Florida; and
2. All persons, including subcontractors, assigned by the Vendor/Consultant to perform work pursuant to the contract with the Department.

Company/Firm: Marand Builders, Inc.

Authorized Signature: _____

Title: Vice President

Date: August 23, 2013

EXHIBIT "C"
TO GENERAL CONDITIONS TO ITB # 13-05
CITY OF FERNANDINA BEACH

DRUG-FREE WORKPLACE CERTIFICATION

The below-signed Proposer certifies that it has implemented a drug-free workplace program. In order to have a drug-free workplace prepare, a business shall:

1. Publish a statement notifying employees that the unlawful manufacture, distribution, dispensing, possession, or use of a controlled substance is prohibited in the workplace and specifying the actions that will be taken against employees for violation of such prohibition.
2. Inform employees about the dangers of drug abuse in the workplace, the business's policy of maintaining a drug-free workplace, any available drug counseling, rehabilitation, and employee assistance programs, and the penalties that may be imposed upon employees for drug abuse violations.
3. Give each employee engaged in providing the commodities or services a copy of the statement specified in paragraph 1.
4. In the statement in paragraph 1., notify the employees that, as a condition of working on the commodities or contractual services that are under bid, the employee will abide by the terms of the statement and will notify the employer of any conviction of, or plea of nolo contendere to, any violation occurring in the workplace no later than five (5) working days after such conviction.
5. Impose a sanction on, or require fine satisfactory participation in drug abuse assistance or rehabilitation program if such is available in the employee's community, by any employee who is convicted.
6. Make a good faith effort to continue to maintain a drug-free workplace through implementation of this section.

As the person authorized to sign this statement, I Certify that this firm complies fully with the above drug-free workplace requirements.

COMPANY: Marand Builders, Inc.

CITY: Atlantic Beach STATE: FL ZIP CODE: 32233

TELEPHONE NUMBER(S): 904-247-3211

SIGNATURE: 

NAME (TYPED OR PRINTED): Nathan Hayes TITLE: Vice President

EXHIBIT "A"

CITY OF FERNANDINA BEACH, FLORIDA

ADDENDUM ONE
FOR
INVITATION TO BID
ITB #13-05

FERNANDINA BEACH BRANCH LIBRARY EXPANSION & RENOVATION

Prepared By:
City of Fernandina Beach
204 Ash Street
Fernandina Beach, FL 32034

ADDENDUM DATE: AUGUST 13, 2013

INTRODUCTION

The City of Fernandina Beach is accepting competitive sealed bids for the **FERNANDINA BEACH BRANCH LIBRARY EXPANSION & RENOVATION**.

The City of Fernandina Beach requests sealed bids by **2:00 pm, August 23, 2013** from qualifying contractors to furnish all labor, materials, equipment, and other items, facilities, and services for the proper execution and completion of the above-referenced project in accordance with the specifications and accompanying drawings published July 24, 2013, as Invitation to Bid 13-05.

Any submittal received after the above stated time and date will not be considered. It shall be the sole responsibility of the bidder to have its proposal delivered to the City of Fernandina Beach, by U.S. Mail, hand delivery or any other method available to him/her; however, facsimile or electronic submittals will not be accepted. Delay in delivery shall be the sole responsibility of the bidder. Submittals received after the deadline will not be considered.

THIS ADDENDUM

The following changes are applicable to the original ITB documents and specifications of ITB 13-05. This Addendum now becomes part of the original Invitation to Bid and shall be acknowledged by attaching a copy of this Addendum, signed by an authorized representative of the person or company submitting a proposal, to Exhibit "A" -- Bid Form. Failure to do so may disqualify the Proposal.

NAME: Nathan Hayes/Marand Builders, Inc. TITLE V.P.

ADDRESS: 2426 Mayport Road # 1

CITY: Atlantic Beach STATE: FL

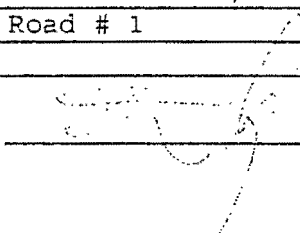
AUTHORIZED SIGNATURE:  DATE: 8/23/13

EXHIBIT "A"

CITY OF FERNANDINA BEACH, FLORIDA

ADDENDUM TWO
FOR
INVITATION TO BID
ITB #13-05
FERNANDINA BEACH BRANCH LIBRARY EXPANSION & RENOVATION

Prepared By:
City of Fernandina Beach
204 Ash Street
Fernandina Beach, FL 32034

ADDENDUM DATE: AUGUST 13, 2013

INTRODUCTION

The City of Fernandina Beach is accepting competitive sealed bids for the **FERNANDINA BEACH BRANCH LIBRARY EXPANSION & RENOVATION**.

The City of Fernandina Beach requests sealed bids by **2:00 pm, August 23, 2013** from qualifying contractors to furnish all labor, materials, equipment, and other items, facilities, and services for the proper execution and completion of the above-referenced project in accordance with the specifications and accompanying drawings published July 24, 2013, as Invitation to Bid 13-05.

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NAME: Nathan Hayes/Marand Builders, Inc. TITLE V.P.
ADDRESS: 2426 Mayport Road # 1
CITY: Atlantic Beach STATE: FL
AUTHORIZED SIGNATURE: _____ DATE: 8/23/13

CITY OF FERNANDINA BEACH, FLORIDA
ADDENDUM THREE
FOR
INVITATION TO BID
ITB #13-05
FERNANDINA BEACH BRANCH LIBRARY EXPANSION & RENOVATION

Prepared By:
City of Fernandina Beach
204 Ash Street
Fernandina Beach, FL 32034

ADDENDUM DATE: AUGUST 16, 2013

INTRODUCTION

The City of Fernandina Beach is accepting competitive sealed bids for the **FERNANDINA BEACH BRANCH LIBRARY EXPANSION & RENOVATION**.

The City of Fernandina Beach requests sealed bids by **2:00 pm, August 23, 2013** from qualifying contractors to furnish all labor, materials, equipment, and other items, facilities, and services for the proper execution and completion of the above-referenced project in accordance with the specifications and accompanying drawings published July 24, 2013, as Invitation to Bid 13-05.

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NAME: Nathan Hayes/Marand Builders, Inc. TITLE V.P.
ADDRESS: 2426 Mayport Road # 1
CITY: Atlantic Beach STATE: FL
AUTHORIZED SIGNATURE: _____ DATE: 8/23/13

CITY OF FERNANDINA BEACH, FLORIDA
ADDENDUM FOUR
FOR
INVITATION TO BID
ITB #13-05
FERNANDINA BEACH BRANCH LIBRARY EXPANSION & RENOVATION

Prepared By:
City of Fernandina Beach
204 Ash Street
Fernandina Beach, FL 32034

ADDENDUM DATE: AUGUST 20, 2013

INTRODUCTION

The City of Fernandina Beach is accepting competitive sealed bids for the **FERNANDINA BEACH BRANCH LIBRARY EXPANSION & RENOVATION**.

The City of Fernandina Beach requests sealed bids by 2:00 pm, August 23, 2013 from qualifying contractors to furnish all labor, materials, equipment, and other items, facilities, and services for the proper execution and completion of the above-referenced project in accordance with the specifications and accompanying drawings published July 24, 2013, as Invitation to Bid 13-05.

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NAME: Nathan Hayes TITLE Vice President
ADDRESS: 2426 Mayport Road # 1
CITY: Atlantic Beach STATE: FL
AUTHORIZED SIGNATURE: _____ DATE: 8/23/13

EXHIBIT "A"



LIST OF SIMILAR PROJECTS

<u>TYPE OF WORK</u>	<u>NAME AND ADDRESS OF CLIENT</u>	<u>YEAR</u>	<u>CONTRACT PRICE</u>
Interior Build-out 20,000 SF	Bank of America 4951 Savarese Circle Bldg 7 Tampa, FL	2013	\$ 1,200,000
New Building 2,800 SF	Fifth Third Bank 2206 E Fowler Ave. Tampa, FL	2011	\$ 680,000
New Building 2,800 SF	Fifth Third Bank 650 Atlantic Blvd. Atlantic Beach, FL	2011	\$ 670,000
New Building 2,800 SF	Fifth Third Bank Miramar, FL	2011	\$ 565,000
78 Renovations Throughout FL	Wells Fargo Multiple Locations Florida	2010	\$ 4,100,000

EXHIBIT "A"



REFERENCE LIST

Nicholas Smith Navy Federal CU 703-206-3811 Fax 703-255-8736
nicholas_smith@navyfederal.org

Jonathan Shaughnessy Wells Fargo 904-391-7830 Fax 904-608-7070
jon.shaughnessy@wellsfargo.com

Mark Hughes Viox Services Fax 239-465-9619
mark_hughes@viox-services.com

EXHIBIT "A"



EQUIPMENT LIST

Porter Cable Dustless Drywall Sander W/ Vacuum
Leica Rugby 100 Laser Level
Bosch Hammer Drill
Perry Scaffold
2- Circular Saws
2-Dewalt Hammer Drills
2- Makita 3 piece battery powers tool kits
Numerous small hand tools

Marand has valid rental accounts all over FL to rent any other equipment that may be needed.



2012-2013 BUSINESS TAX RECEIPT

CITY OF JACKSONVILLE/DUVAL COUNTY
MICHAEL CORRIGAN, TAX COLLECTOR

201 E. FLORIDA STREET ROOM 100 JACKSONVILLE, FL 32202-1170
PHONE: (904) 630-1515 ext 31 FAX: (904) 630-1412
WEB SITE: www.doc.net/fl

Note - A penalty is imposed for failure to keep this receipt exhibited conspicuously at your place of business.
This receipt is furnished pursuant to chapter 770-772 City ordinance codes.

HAYES, NATHAN E
MARAND BUILDERS INC
2426 MAYPORT RD
STE 1
ATLANTIC BEACH, FL 32233

ACCOUNT NUMBER:

LOCATION ADDRESS:

2426 MAYPORT RD STE 1
ATLANTIC BEACH, FL 32233

DESCRIPTION:

QUALIFYING AGENT CONTRACTORS

COUNTY RECEIPT DESC:

QUALIFYING AGENT CONTRACTORS

MUNICIPAL RECEIPT DESC:

MC 772 325

COUNTY TAX:

1.00

MUNICIPAL TAX:

1.0000

TOTAL TAX PAID:

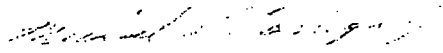
1.0000

VALID FROM September 1, 2012 TO September 30, 2013

ATTENTION

THIS RECEIPT IS FOR BUSINESS TAX RECEIPT ONLY.
CERTAIN BUSINESS MAY REQUIRE ADDITIONAL STATE LICENSING.

This is a business tax receipt only. It does not permit the receipt holder to violate any existing regulatory or zoning laws of the County or City. Nor does it exempt the receipt holder from any other license or permit required by law. This is not a certification of the licensee's qualifications.



TAX COLLECTOR

THIS BECOMES A RECEIPT AFTER VALIDATION.

2012-2013 BUSINESS TAX RECEIPT TOTAL 1.0000

EXHIBIT "A"

STATE OF FLORIDA DEPARTMENT OF BUSINESS AND PROFESSIONAL REGULATION CONSTRUCTION INDUSTRY LICENSING BOARD

6147330

STATE OF FLORIDA

DEPARTMENT OF BUSINESS AND PROFESSIONAL REGULATION
CONSTRUCTION INDUSTRY LICENSING BOARD

SEQ# L12053101655

DATE	BATCH NUMBER	LICENSE NBR
/31/2012	118195421	CGC1515920

GENERAL CONTRACTOR
as defined below IS CERTIFIED
under the provisions of Chapter 499 FS.
Expiration date: AUG 31, 2014

HAYES, NATHAN E
MARAND BUILDERS, INC.
1261 GREEN CAY AVE
ATLANTIC BEACH FL 32233

RICK SCOTT
GOVERNOR

DISPLAY AS REQUIRED BY LAW

KEN LAWSON
SECRETARY



STATE OF FLORIDA
DEPARTMENT OF BUSINESS AND
PROFESSIONAL REGULATION

CGC1515920 05/31/12 118195421

CERTIFIED GENERAL CONTRACTOR
HAYES, NATHAN E
MARAND BUILDERS, INC.

IS CERTIFIED under the provisions of Ch.489 FS
Expiration date: AUG 31, 2014 L12053101655

THE AMERICAN INSTITUTE OF ARCHITECTS

AIA Document A310 Bid Bond

KNOW ALL MEN BY THESE PRESENTS, THAT WE Marand Builders, Inc.

6215-B Stuart Andrew Blvd., Charlotte, NC 28217

as Principal, hereinafter called the Principal, and North American Specialty Insurance Company

6230 Fairview Road, Suite 230, Charlotte, NC 28210

a corporation duly organized under the laws of the State of NH

as Surety, hereinafter called the Surety, are held and firmly bound unto City of Fernandina Beach

FL

as Obligee, hereinafter called the Obligee, in the sum of Five Percent of Amount Bid

Dollars (\$ _____ 5% _____),

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 City of Fernandina Beach Branch of the Nassau County Public Library - Expansion and Renovation 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 materials 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 23rd day of August, 2013

Marand Builders, Inc.

(Principal)

(Seal)

By: _____

(Title)

(Witness)

North American Specialty Insurance Company

(Surety)

(Seal)

By: _____

Attorney-in-Fact

Ramona Fewell

(Title)

Debra S. Ritter

Debra S. Ritter

(Witness)



EXHIBIT "A"

NAS SURETY GROUP

NORTH AMERICAN SPECIALTY INSURANCE COMPANY
WASHINGTON INTERNATIONAL INSURANCE COMPANY

GENERAL POWER OF ATTORNEY

KNOW ALL MEN BY THESE PRESENTS, THAT North American Specialty Insurance Company, a corporation duly organized and existing under laws of the State of New Hampshire, and having its principal office in the City of Manchester, New Hampshire, and Washington International Insurance Company, a corporation organized and existing under the laws of the State of New Hampshire and having its principal office in the City of Schaumburg, Illinois each does hereby make, constitute and appoint: Ramona Fewell

Its true and lawful Attorney-in-Fact, to make, execute, seal and deliver, for and on its behalf and as its act and deed, the following surety bond:

Principal: Marand Builders, Inc.

Bond Number: Bid Bond

Obligee: City of Fernandina Beach

Bond Amount: See Bond Form

Bond Description: City of Fernandina Beach Branch of the Nassau County Public Library - Expansion and Renovation Project

Provided that no bond or undertaking or contract of suretyship executed under this authority shall exceed the amount of:

FIFTY MILLION (\$50,000,000) DOLLARS

This Power of Attorney is granted and is signed by facsimile under and by the authority of the following Resolutions adopted by the Boards of Directors of both North American Specialty Insurance Company and Washington International Insurance Company at meetings duly called and held on the 9th of May, 2012:

"RESOLVED, that any two of the Presidents, any Managing Director, any Senior Vice President, any Vice President, any Assistant Vice President, the Secretary or any Assistant Secretary be, and each or any of them hereby is authorized to execute a Power of Attorney qualifying the attorney named in the given Power of Attorney to execute on behalf of the Company bonds, undertakings and all contracts of surety, and that each or any of them hereby is authorized to attest to the execution of any such Power of Attorney and to attach therein the seal of the Company; and it is

FURTHER RESOLVED, that the signature of such officers and the seal of the Company may be affixed to any such Power of Attorney or to any certificate relating thereto by facsimile, and any such Power of Attorney or certificate bearing such facsimile signatures or facsimile seal shall be binding upon the Company when so affixed and in the future with regard to any bond, undertaking or contract of surety to which it is attached."



By [Signature]
Steven P. Anderson, Senior Vice President of Washington International Insurance Company & Senior Vice President of North American Specialty Insurance Company



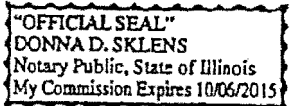
By [Signature]
David M. Layman, Vice President of Washington International Insurance Company & Vice President of North American Specialty Insurance Company

IN WITNESS WHEREOF, North American Specialty Insurance Company and Washington International Insurance Company have caused their official seals to be hereunto affixed, and these presents to be signed by their authorized officers this 25th day of May 20 12.

North American Specialty Insurance Company
Washington International Insurance Company

State of Illinois
County of Cook ss:

On this 25th day of May 20 12, before me, a Notary Public personally appeared Steven P. Anderson, Senior Vice President of Washington International Insurance Company and Senior Vice President of North American Specialty Insurance Company and David M. Layman, Vice President of Washington International Insurance Company and Vice President of North American Specialty Insurance Company, personally known to me, who being by me duly sworn, acknowledged that they signed the above Power of Attorney as officers of and acknowledged said instrument to be the voluntary act and deed of their respective companies.



[Signature]
Donna D. Sklens, Notary Public

I, Jeffrey Goldberg, the duly elected Assistant Secretary of North American Specialty Insurance Company and Washington International Insurance Company, do hereby certify that the above and foregoing is a true and correct copy of a Power of Attorney given by said North American Specialty Insurance Company and Washington International Insurance Company, which is still in full force and effect.

IN WITNESS WHEREOF, I have set my hand and affixed the seals of the Companies this 23rd day of August, 2013.

[Signature]
Jeffrey Goldberg, Vice President & Assistant Secretary of Washington International Insurance Company & Assistant Secretary of North American Specialty Insurance Company

SUBCONTRACTORS LIST

Sitework	<u>D.T. SERVICES</u>
Landscaping	<u>DAVEY</u>
Demolition	<u>HONEST CONSTRUCTION</u>
Concrete	<u>R + R UNLIMITED DEVEL.</u>
Masonry	<u>R + R UNLIMITED DEVEL.</u>
Structural Steel	<u>FUWANNEE IRON WORKERS</u>
Millwork	<u>COMMERCIAL CASE WORK / CASE WORK PART</u>
Roofing	<u>MCCOUREY WALLER</u>
Doors and Hardware	<u>MURREYS CONTRACT</u>
Glazing	<u>FREITAS WINDOWS SYS.</u>
Drywall	<u>SUBSTANTIAL COMPLETION</u>
Acoustical Ceilings	<u>SUBSTANTIAL COMPLETION</u>
Stucco	<u>FIELDS STUCCO</u>
Flooring	<u>ACOUSTI</u>
Painting	<u>PAINTING UNLIMITED</u>
Plumbing	<u>BARRY PLUMBING</u>
HVAC	<u>ALL STATE HEATING + A/R</u>
Fire Sprinklers	<u>J.W. GAY</u>
Electrical	<u>T + M ELECTRIC</u>

CITY COMMISSION AGENDA ITEM
CITY OF FERNANDINA BEACH

SUBJECT: Resolution 2013-~~128~~128
Award of Bid #13-05 for the Fernandina Beach Branch Library Expansion and Renovation

DEPARTMENT: City Manager's Office

ATTACHMENTS: Ordinance Resolution
 Support Documents Other

RECOMMENDED ACTION: Approve Resolution 2013-~~128~~128 Award Bid #13-05 to Marand Builders, Inc.

SUMMARY: The City solicited bids for the Fernandina Beach Branch Library Expansion and Renovation Project through publication of Invitation to Bid #13-05 on July 24, 2013. Nine (9) bids were received and opened on August 23, 2013 (bid tally attached).

The lowest qualified bid received is from Marand Builders, Inc. in the amount of \$1,385,974 for the Base Bid. Bid Alternate #1, the cost for the construction of the Technology area in the existing courtyard is \$45,003; Bid Alternate #2, the cost for the replacement of six (6) existing windows on the east side of the building is \$22,250; and, Bid Alternate #3, the cost to demolish and replace the river rock sidewalk sections within the project site to match the stamped concrete sidewalk specified elsewhere within the project site, is \$7,150. The total of the Base Bid and the three (3) Alternates is \$1,460,377; this total is also the lowest qualified total bid.

The submitted bid has been reviewed by the project architect and resulted in a recommendation to award the Construction Contract to Marand Builders, Inc. The City Manager requests authorization to negotiate the contract, based on the Base Bid plus Bid Alternate #1 only (total of \$1,430,977).

FISCAL IMPACT: A total of \$1,069,000 is available in the Library account #300-3000-571.6200; \$600,000 is included in the FY 2013/2014 Budget as a commitment from Nassau County; the Friends of the Library have committed an additional \$400,000 in donations to be used for the project. The contribution from Friends of the Library is not currently included in the FY 2013/2014 Budget, to do so will require the Commission approve a budget amendment in the near future.

CITY ATTORNEY COMMENTS: No additional comments.

DEPARTMENT HEAD	Submitted by: Joe Gerrity, City Manager	Date: 8/28/13
	Requested Agenda	Date: 9/17/13
FINANCE DEPARTMENT	Approved as to Budget Requirements <i>PTC</i>	Date: 9/11/13
CITY ATTORNEY	Approved as to Form and Legality <i>TEB</i>	Date: 9/11/13
CITY MANAGER	Approved Agenda Item for 09/17/13 <i>Joe B</i>	Date: 8/28/13

COMMISSION ACTION: Approved As Recommended Disapproved
 Approved With Modification Postponed to Time Certain
 Other Tabled

Approved at the City Commission Meeting
Held on: 9/17/13
Voted: 5-0 Initial: JGB

SECTION 00 01 01

PROJECT TITLE PAGE

PROJECT MANUAL - CONSTRUCTION DOCUMENTS

NASSAU COUNTY LIBRARY
FERNANDINA BEACH BRANCH
25 NORTH 4TH STREET
FERNANDIA BEACH, FL 32034

EXPANSION AND RENOVATION PROJECT

FOR

THE CITY OF FERNANDINA BEACH, FLORIDA
204 ASH STREET
FERNANDINA BEACH, FLORIDA 32034
VRL PROJECT NO. 1207
JULY 2013

VRL ARCHITECTS, INC.
JACKSONVILLE, FLORIDA

TABLE OF CONTENTS

INTRODUCTORY INFORMATION

00 01 01	PROJECT TITLE PAGE	1
00 01 10	TABLE OF CONTENTS	5
	INVITATION TO BID	8
	BID FORM	1
	SWORN STATEMENT ON PUBLIC ENTITY CRIMES	2
	DRUG-FREE WORKPLACE CERTIFICATION	1
	E-VERIFY STATEMENT	1
	STANDARD GENERAL CONDITIONS	42

SUMMARY

01 10 00	SUMMARY	3
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PRICE AND PAYMENT PROCEDURES

01 20 00	PRICE AND PAYMENT PROCEDURES	3
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ADMINISTRATIVE REQUIREMENTS

01 30 00	ADMINISTRATIVE REQUIREMENTS	5
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QUALITY REQUIREMENTS

01 40 00	QUALITY REQUIREMENTS	4
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TEMPORARY FACILITIES AND CONTROLS

01 50 00	TEMPORARY FACILITIES AND CONTROLS	3
01 58 13	TEMPORARY PROJECT SIGNAGE	2

PRODUCT REQUIREMENTS

01 60 00	PRODUCT REQUIREMENTS	3
----------	----------------------	---

EXECUTION AND CLOSEOUT REQUIREMENTS

01 70 00	EXECUTION AND CLOSEOUT REQUIREMENTS	9
01 71 00	AS-BUILT DRAWINGS	2

EXHIBIT "A"

01 74 19	CONSTRUCTION WASTE MANAGEMENT AND DISPOSAL	.....	3
01 78 00	CLOSEOUT SUBMITTALS	.....	4

DIVISION 02 - EXISTING CONDITIONS

02 06 00	SOIL BORINGS	.....	1
02 41 00	SITE DEMOLITION	.....	3
02 41 01	BUILDING DEMOLITION	4

DIVISION 03 - CONCRETE

03 30 00	CAST-IN-PLACE CONCRETE	8
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DIVISION 04 - MASONRY

04 27 31	REINFORCED UNIT MASONRY	8
04 72 00	CAST STONE MASONRY	4

DIVISION 05 - METALS

05 12 00	STRUCTURAL STEEL FRAMING	.....	5
05 21 00	STEEL JOIST FRAMING	.....	4
05 31 00	STEEL DECKING	.....	4
05 50 00	METAL FABRICATIONS	.....	4
05 52 13	PIPE AND TUBE RAILINGS	.....	3

DIVISION 06 - WOOD, PLASTICS, AND COMPOSITES

06 10 00	ROUGH CARPENTRY	.....	5
06 41 00	ARCHITECTURAL WOOD CASEWORK	.....	4

DIVISION 07 - THERMAL AND MOISTURE PROTECTION

07 11 13	BITUMINOUS DAMPPROOFING	.....	2
07 21 00	THERMAL INSULATION	.....	3
07 52 00	MODIFIED BITUMINOUS MEMBRANE ROOFING	.....	9
07 62 00	SHEET METAL FLASHING AND TRIM	.....	4
07 72 00	ROOF ACCESSORIES	.....	3
07 84 00	FIRESTOPPING	.....	2
07 90 05	JOINT SEALERS	.....	4

DIVISION 08 - OPENINGS

08 11 13	HOLLOW METAL DOORS AND FRAMES	4
08 14 16	FLUSH WOOD DOORS	4
08 14 33	STILE AND RAIL WOOD DOORS	3
08 43 13	ALUMINUM-FRAMED STOREFRONTS	6
08 71 00	DOOR HARDWARE	12
08 80 00	GLAZING	4

DIVISION 09 - FINISHES

09 21 16	GYPSUM BOARD ASSEMBLIES	7
09 24 00	PORTLAND CEMENT PLASTERING	3
09 30 00	TILING	3
09 51 00	ACOUSTICAL CEILINGS	4
09 65 00	RESILIENT FLOORING	4
09 67 00	FLUID-APPLIED FLOORING	3
09 68 00	CARPETING	3
09 90 00	PAINTING AND COATING	8

DIVISION 10 - SPECIALTIES

10 14 00	SIGNAGE	3
10 21 13.19	PLASTIC TOILET COMPARTMENTS	2
10 26 01	WALL AND CORNER GUARDS	2
10 28 00	TOILET, BATH, AND LAUNDRY ACCESSORIES	4
10 44 00	FIRE PROTECTION SPECIALTIES	2

DIVISION 12 - FURNISHINGS

12 21 13	HORIZONTAL LOUVER BLINDS	2
12 36 00	COUNTERTOPS	3

DIVISION 22 - PLUMBING

22 30 00	PLUMBING	9
----------	----------	---

DIVISION 23 - MECHANICAL

23 03 01	BASIC MECHANICAL REQUIRMENTS	19
23 05 03	MECHANICAL IDENTIFICATION	4

EXHIBIT "A"

23 05 13	MOTORS	2
23 05 29	SUPPORTS AND ANCHORS	9
23 05 48	VIBRATION ISOLATION	6
23 05 93	TESTING, ADJUSTING AND BALANCING	8
23 07 00	MECHANICAL INSULATION	10
23 22 13	CONDENSATE DRAIN PIPING	2
23 31 00	DUCTS	6
23 33 00	DUCTWORK ACCESSORIES	5
23 34 00	POWER VENTILATORS	4
23 37 00	AIR OUTLETS AND INLETS	5
23 81 06	PACKAGED ROOFTOP AIR CONDITIONING UNITS- MEDIUM CAPACITY	8

DIVISION 26 - ELECTRICAL

26 03 05	ELECTRICAL GENERAL REQUIREMENTS	6
26 03 07	MINOR ELECTRICAL DEMOLITION FOR REMODELING	2
26 05 19	WIRE AND CABLE	3
26 05 26	SECONDARY GROUNDING	3
26 05 29	SUPPORTING DEVICES	2
26 05 32	CONDUIT	4
26 05 33	BOXES	3
26 05 34	FLOOR BOXES	2
26 05 53	ELECTRICAL IDENTIFICATION	1
26 24 13	SWITCHBOARDS	5
26 24 16	PANELBOARDS	2
26 24 18	MOTOR CONTROL	3
26 27 16	CABINETS AND ENCLOSURES	2
26 27 26	WIRING DEVICES	2
26 28 19	DISCONNECT SWITCHES	1
26 35 55	TRANSIENT VOLTAGE SURGE SUPPRESSION	8
26 51 00	LIGHTING FIXTURES	2

DIVISION 27- COMMUNICATION CIRCUIT PATHWAYS

27 13 43	COMMUNICATIONS CIRCUIT PATHWAYS	2
----------	---------------------------------	---

DIVISION 28 – ELECTRIC SAFETY AND SECURITY

28 31 00	FIRE ALARM AND SMOKE DETECTION SYSTEMS	8
----------	--	---

EXHIBIT "A"

DIVISION 31 - EARTHWORK

31 00 00	EARTHWORK	11
31 20 00	SITE CLEARING, STRIPPING, AND GRUBBING	4
31 23 19	DEWATERING	3
31 25 00	EROSION AND SEDIMENTATION CONTROL	5
31 31 16	TERMITE CONTROL	2

DIVISION 32 - EXTERIOR IMPROVEMENTS

32 12 16	ASPHALTIC CONCRETE PAVING	8
32 13 00	SITE CONCRETE	7
32 92 00	GRASSING	5
32 93 00	PLANTS	5

DIVISION 33 - UTILITIES

33 11 00	PIPEWORK - WATER DISTRIBUTION SYSTEM	18
----------	--------------------------------------	----

**CITY OF FERNANDINA BEACH, FLORIDA
INVITATION TO BID
#13-05**

The City of Fernandina Beach, Florida is accepting competitive sealed bids for the **Fernandina Beach Branch Library Expansion and Renovation.**

The City will receive sealed bids at the location stated below no later than **2pm, Friday, August 23, 2013.**

All interested bidders are required to attend a **mandatory** pre-bid meeting to be held at the **CITY HALL COMMISSION CHAMBERS, 204 ASH STREET, FERNANDINA BEACH, FLORIDA** at **11am, Tuesday, August 6, 2013.** Failure to attend the pre-bid meeting will result in bid rejection.

Any submittal received after the above stated time and date will not be considered. It shall be the sole responsibility of the Bidder to have its Bid delivered to the City of Fernandina Beach, by U.S. Mail, hand delivery or any other method available to him/her; however, facsimile or telegraphic submittals will not be accepted. Delay in delivery shall be the sole responsibility of the Bidder. Submittals received after the deadline will not be considered. Award of the Bid is subject to authorization and appropriation of funds in the fiscal year 2013-2014 budget.

BIDDERS ARE REFERRED TO THE ATTACHED GENERAL CONDITIONS OF INVITATION TO BID FOR OTHER IMPORTANT INFORMATION REGARDING THE ITB AND BID PROCESS.

The original bid submittal **3 copies (1 Original, 2 Copies)** must be delivered to City Hall in a sealed package, clearly marked on the outside, **ITB # 13-05** and addressed to:

City of Fernandina Beach
Attn: City Clerk's Office – **ITB #13-05** Submittal
204 Ash Street
Fernandina Beach, FL 32034

Hand delivered Submittal is to be taken to the Clerk's Office at the above address.

The bid shall be submitted on the specified Bid Form **3 copies (1 Original, 2 Copies)** hereto attached as "Exhibit A". The person signing the Bid Response Form shall have the authority to bind the proposer to the Bid. All information on the Bid form shall be provided, or the Bid may not be accepted.

The competitive sealed Bid shall be accompanied by a "Public Entity Crimes Statement" herein provided as "Exhibit B", a "Drug Free Workplace Certification", herein provided as "Exhibit C", and an "E-Verify Statement," herein provided as "Exhibit D".

SCOPE OF SERVICES

As per the Project Manual and drawings provided by VRL Architects, Inc., the work shall include furnishing all labor, materials and equipment for the proper execution of demolition, renovations, additions, HVAC, Fire Sprinkler System and related site work to the Fernandina Beach Branch of the Nassau County Public Library located at 25 North 4th Street, Fernandina Beach, Florida. The work includes, but is not limited to, the following:

- 1) Demolition and removal of selected structures, walks, paving and other materials.
- 2) Selective demolition and remodeling work.
- 3) Addition construction and renovate the following areas, complete including operational mechanical and electrical work, finishes, and fire sprinkler system:
 - a) New addition to existing library building.
 - b) Renovation in various areas of the existing building.
 - c) New HVAC, fire alarm, lighting, electrical, plumbing, fire sprinkler system.
 - d) Related site work.
- 4) Plumbing: Alter existing system and add new construction, keeping existing in operation.
- 5) HVAC: Replace existing system with new construction.
- 6) Electrical power and Lighting: Replace existing system with new construction.
- 7) Fire Suppression Sprinklers: Provide new Fire Sprinkler System to both existing and new construction areas.
- 8) Fire Alarm: Replace existing system with new construction.
- 9) Telephone and Data: Provide raceways for owner provided systems; keep existing systems in operation.
- 10) Removal and delivery of specific existing items to City of Fernandina Beach, Florida prior to start of work.

Additive Alternate Bid Item 1: Technology area in existing courtyard.

Additive Alternate Bid Item 2: Replacement of six (6) large windows on east side of existing building.

Additive Alternate Bid Item 3: Demolish and replace the river rock sidewalk sections within the project site to match the stamped concrete sidewalk specified elsewhere within the project site.

TIMELINE - see Project Manual

QUALIFICATIONS

Bidders must submit with the Bid Proposal evidence of capabilities to complete the **Fernandina Beach Branch Library Expansion and Renovation**. This will include a list of similar projects (scope and size) successfully completed in the past, a reference list, an equipment list, a list of subcontractors, and other information requested by the City of Fernandina Beach. *Failure to submit qualification information with the Bid Proposal may result in rejection of a Bid.* Successful Bidder is required to have a Business License in the jurisdiction where their home office is located and a Florida Contractor's License in accordance with Chapter 489 Florida Statutes.

INSURANCE REQUIREMENTS

Insurance requirements are outlined in the General Conditions of this Invitation to Bid.

BOND REQUIREMENTS

Bond requirements are outlined in the General Conditions of this Invitation to Bid.

AWARD

Bids shall be priced as a lump sum amount for the Base Bid and the two (2) Additive Alternates. Award recommendation shall be made based on price, ability to meet the time line, and qualifications.

Firms are hereby put on notice that no contact shall be made with any of the City Commission members, City staff, or others that may be involved in the selection process to discuss this request or to influence the outcome of the selection.

CONTACT

All questions and/or requests for information are to be directed *in writing only* to Marshall McCrary, Deputy City Manager, at dmccrary@fbfl.org.

ADDENDA

A written response to bidder questions will be issued via Addendum and posted on the City's website at www.fbfl.us/bids. It is the bidder's responsibility to check the City's website for Addenda prior to submitting their bid. **The deadline for questions is 5pm on Wednesday, August 14, 2013.**

BIDDER SHALL SIGNIFY RECEIPT OF ADDENDA (IF ANY). Failure to Acknowledge Receipt of any Addendum may result in rejection of the bid.

GENERAL CONDITIONS OF INVITATION TO BID
**** FOR CONSTRUCTION SERVICES ****
ITB #13-05

1. PREPARATION OF BID

- a. INVITATION TO BID shall be prepared in accordance with the following:
- b. The enclosed Bid Form, attached hereto as "Exhibit A", shall be used when submitting your INVITATION TO BID.
- c. All information required by the Bid Form shall be furnished. The Bidder shall print or type his/her name and manually sign the Form and any continuation sheet on which an entry is made.
- d. Unit prices shall be shown and where there is an error in extension of price, the unit price shall govern.
- e. Alternate Bids will not be considered unless authorized by the Invitation to Bid.
- f. Bidders will **not** include federal taxes nor State of Florida sales, excise, and use taxes in prices, as the City is exempt from payment of such taxes. An exemption certificate will be signed where applicable upon request.
- g. Bidders shall make all investigations necessary to thoroughly inform themselves about any and all conditions related to the performance of the contract. Plea of ignorance by the Bidder of conditions that exists or may hereafter exist as a result of failure or omission on the part of the Bidder to make the necessary examinations and investigations, or failure to fulfill in every detail the requirements provided for in the Purchasing Policy, Purchasing Ordinance and/or State and Federal Statutes. The City's Purchasing Ordinance is set forth in Chapter 2-420, *et seq.*
- h. Prices quoted must be FOB City of Fernandina Beach, Florida with all transportation charges prepaid unless otherwise specified in the Invitation to Bid.
- i. Deliveries are to be FOB Destination unless otherwise specified in the Invitation to Bid.
- j. Deliveries are to be made during regular business hours.
- k. Bids and Bid prices shall be valid for a minimum of sixty (60) days, unless otherwise stated on the INVITATION TO BID.

2. SUBMISSION OF BIDS

- a. Bids and changes thereto shall be enclosed in sealed envelopes & addressed as instructed on the Bid Form. The name and address of the Bidder, the date and hour of the Invitation to Bid opening and the material or service shall be placed on the outside of the envelope.
- b. INVITATION TO BID must be submitted on the forms furnished. Telegraphic Bids will not be considered.

3. REJECTION OF BIDS

- a. The City reserves the right to accept or reject any or all Bids, to waive irregularities and technicalities, and to request resubmission or to re-advertise for the services. The City shall be the sole judge of the submittals. The City's decision shall be final.

4. WITHDRAWAL OF BIDS

- a. Bids may not be withdrawn after the time set for the opening for a period of time as specified.
- b. Bids may be withdrawn prior to the time set for the opening. Such request must be in writing.

5. LATE BIDS

- a. INVITATION TO BID and modifications received after the time set for the opening will not be considered.
- b. Modifications in writing received prior to the time set for the opening will be accepted.

6. LOCAL, STATE, AND FEDERAL COMPLIANCE

- a. Bidders shall comply with all local, state, and federal directives, orders and laws as applicable to the INVITATION TO BID and subsequent contract(s) including but not limited to Equal Employment Opportunity (EEO), Minority Business Enterprise (MBE), and OSHA as applicable to this contract.
- b. A "Public Entity Crimes Statement", in accordance with Florida Statutes, Section 287.133 (3) (a), on Public Entity Crimes, attached hereto as Exhibit "B", must be received at the time of the bid.
- c. A "Drug Free Workplace Certification" attached hereto as Exhibit "C", must be received at the time of the bid.
- d. The City of Fernandina Beach requires that the Bidder selected will not discriminate under the contract against any person, in accordance with federal, state and local government regulations.

7. COLLUSION

- a. The Bidder, by affixing his signature to the Bid Form, agrees to the following:
"Bidder certifies that his INVITATION TO BID is made without previous understanding, agreement, or connection with any person, firm or corporation making a Bid for the same item(s) and is in all respects fair, without outside control, collusion, fraud, or otherwise illegal action".

8. AWARD OF INVITATION TO BID

- a. The INVITATION TO BID will be awarded to the qualified supplier with the best value Bid whose Bid, conforming to the INVITATION TO BID, is most advantageous to the City of Fernandina Beach, price and other factors considered.
- b. The City reserves the right to accept and award item by item, and/or by group, or in the aggregate.
- c. A written award of acceptance (Purchase Order), mailed or otherwise furnished to the successful Bidder shall result in a binding contract without further action by either party.
- d. Unless otherwise noted in the specifications, the length of the agreement shall be one year, with 2 one year renewals possible based on the mutual consent of the parties.

9. NOT RESPONSIBLE FOR COSTS

- a. The City shall not be responsible for any cost incurred by a prospective Bidder in responding to this INVITATION TO BID.

10. BONDS

- a. **BID BOND:** A certified check or Bid Bond shall accompany each Bid. The certified check or Bid Bond shall be for an amount not less than five percent (5%) of the Bid price and shall be made payable to the OWNER as a guarantee that the Bidder will not withdraw its bid for a period of ninety (90) calendar days after Bid closing time.
- b. **PERFORMANCE AND PAYMENT BONDS:** In the event the Contract is awarded to the Bidder, Bidder will thereafter enter into a written contract with the OWNER and furnish a Payment and Performance Bond in an amount equal to the contract price, in strict accordance with Section 255.05 of Florida Statutes. Failing to do so, Bidder will forfeit its bid security. Payment and Performance Bond shall be secured from or countersigned by an agency or surety company recognized in good standing and authorized to do business in the State of Florida.

11. PUBLIC INFORMATION

- a. All information contained in this Bid is public information, and as such will be handled in accordance with the Florida Statutes.

12. ADDITIONAL INFORMATION

- a. The City reserves the right to require Bidders to provide references and information on previous similar experience prior to award of the contract.

13. PAYMENT

- a. Payment will be made in accordance with the Florida Prompt Payment Act.

14. BIDDER QUESTIONS

- a. Bidder questions during the bid period shall be submitted in writing to the City of Fernandina Beach via e-mailed to Marshall McCrary, Deputy City Manager, at dmccrary@fbfl.org.

15. MANDATORY PRE-BID CONFERENCE

- a. All bidders are required to attend a **mandatory** pre-bid conference to be held at the Fernandina Beach City Hall at 204 Ash Street, Fernandina Beach, FL at **11am on Tuesday, August 6, 2013**. Failure to attend the pre-bid conference will cause bid rejection.

16. INDEMNIFICATION AND INSURANCE AND PAYMENT

- a. **INDEMNIFICATION:** The parties recognize that the Contractor is an independent contractor. The Contractor agrees to assume liability for and indemnify, hold harmless, and defend the City, its commissioners, mayor, officers, employees, agents, and attorneys of, from, and against all liability and expense, including reasonable attorney's fees, in connection with any and all claims, demands, damages, actions, causes of action, and suits in equity of whatever kind or nature, including claims for personal injury, property damage, equitable relief, or loss of use, to the extent caused by the negligence, recklessness, or intentionally wrongful conduct of the Contractor, its agents, officers, contractors, subcontractors, employees, or anyone else utilized by the Contractor in the performance of this Agreement. The Contractor's liability hereunder shall include all attorney's fees and costs incurred by the City in the enforcement of this indemnification

provision. This includes claims made by the employees of the Contractor against the City and the Contractor hereby waives its entitlement, if any, to immunity under Section 440.11, Florida Statutes. Such obligations contained in this provision shall survive termination of this Agreement and shall not be limited by the amount of any insurance required to be obtained or maintained under this Agreement.

Subject to the limitations set forth in this Section, Contractor shall assume control of the defense of any claim asserted by a third party against the City and, in connection with such defense, shall appoint lead counsel, in each case at the Contractor's expense. The City shall have the right, at its option, to participate in the defense of any third party claim, without relieving Contractor of any of its obligations hereunder. If the Contractor assumes control of the defense of any third party claim in accordance with this paragraph, the Contractor shall obtain the prior written consent of the City before entering into any settlement of such claim. Notwithstanding anything to the contrary in this Section, the Contractor shall not assume or maintain control of the defense of any third party claim, but shall pay the fees of counsel retained by the City and all expenses, including experts' fees, if (i) an adverse determination with respect to the third party claim would, in the good faith judgment of the City, be detrimental in any material respect to the City's reputation; (ii) the third party claim seeks an injunction or equitable relief against the City; or (iii) the Contractor has failed or is failing to prosecute or defend vigorously the third party claim. Each party shall cooperate, and cause its agents to cooperate, in the defense or prosecution of any third party claim and shall furnish or cause to be furnished such records and information, and attend such conferences, discovery proceedings, hearings, trials, or appeals, as may be reasonably requested in connection therewith. It is further the specific intent and agreement of said parties that all the Contract Documents on this Project are hereby amended to include the foregoing indemnification. CONTRACTOR expressly agrees that it will not claim, and waives any claim, that this indemnification violates Section 725.06, Florida Statutes or is unenforceable pursuant to Section 725.06, Florida Statutes.

Nothing contained in the foregoing indemnification shall be construed to be a waiver of any immunity or limitation of liability the CITY may have under the doctrine of sovereign immunity or Section 768.28, Florida Statutes.

b. INSURANCE:

(1) Certificate of Insurance

The CITY shall be furnished proof of insurance coverage as follows:

- The name of the insured, the name of the insurer, the number of the policy, its effective date, and its termination date;
- Statement that the insurer will mail notice to the CITY and a copy to CONTRACTOR at least thirty (30) days prior to any material changes in provisions, cancellation, renewal, or non-renewal of the policy;
- Certificate of Insurance shall be in the form as approved by the CITY, naming the CITY as additional insured, and such Certificate shall clearly state all the coverage required in this Section;
- If requested by the CITY, CONTRACTOR shall furnish complete copies of all insurance policies, forms and endorsements; and
- Receipt of certificates or other documentation of insurance or policies or copies of policies by the CITY or by any of its representatives which indicate less

coverage than required by this agreement does not constitute a waiver of CONTRACTORS obligations to fulfill the requirements of this Section.

(2) Workers' Compensation Insurance

CONTRACTOR shall have in full force, during the life of this agreement, Workers' Compensation and Employer's Liability Insurance for all its employees connected with work under this agreement, and in the event any work is subcontracted, CONTRACTOR shall require the subcontract similarly to provide Workers' Compensation Insurance for all of the latter's employees, unless such employees are covered by the protection afforded by CONTRACTOR. CONTRACTOR may provide a workers' compensation waiver in lieu of workers' compensation insurance where such waiver is properly approved by the Florida Department of Labor and Employment Security and accepted by the CITY in writing. Such insurance or waiver shall comply with the Florida Workers' Compensation Law. In case any class of work conducted under this agreement is not protected under the Workers' Compensation statute, CONTRACTOR shall provide adequate insurance, satisfactory to the CITY, for the protection of employees not otherwise protected.

(3) Liability Insurance

CONTRACTOR shall have in full force, during the life of this agreement, Commercial General Liability and Commercial Automobile Liability Insurance that shall protect the CITY from claims for damage for bodily injury and personal injury, including accidental death, as well as claims for property damages which may arise from tasks associated with or carried out under this agreement, whether such operations are by itself or by anyone directly or indirectly employed by them, and the amount of such insurance shall be minimum limits as follows:

Commercial General Liability:

- Minimum Coverage is \$1,000,000 per occurrence.
- Coverage shall include premises, operations, products, completed operations, independent contractors, contractual liability covering this agreement, contracts and leases, broad form property damage coverage, personal injury and bodily injury.
- If Umbrella or Excess liability coverage is used to satisfy the requirements of this Article, it shall not be more restrictive than the underlying insurance policy coverage.

Commercial Automobile Liability:

- Minimum Coverage is \$1,000,000 per occurrence.
- Coverage shall include bodily injury and property damage arising out of ownership, maintenance or use of any auto, including owned, non-owned and hired automobiles and employee non-ownership use.

- c. **PAYMENT:** Payment due hereunder shall be made by the CITY to CONTRACTOR/VENDOR in accordance with the Florida Prompt Payment Act.

EXHIBIT "A"

BID FORM

CITY OF FERNANDINA BEACH ITB # 13-05

FERNANDINA BEACH BRANCH LIBRARY EXPANSION AND RENOVATION

I hereby submit the following Base Bid for _____.
Price is in accordance with the Specifications and the General Conditions of the ITB as provided.

Base Bid Amount: \$ _____

Additive Alternate Bid Item 1: Technology area in existing courtyard.

Additive Alternate Bid Item 1 Amount: \$ _____

Additive Alternate Bid Item 2: Replacement of six (6) large windows on east side of existing building.

Additive Alternate Bid Item 2 Amount: \$ _____

Additive Alternate Bid Item 3: Demolish and replace the river rock sidewalk sections within the project site to match the stamped concrete sidewalk specified elsewhere within the project site.

Additive Alternate Bid Item 3 Amount: \$ _____

Name: _____

Federal Taxpayer ID: _____

Mailing Address: _____

City, State, & Zip Code: _____

Telephone: _____ Fax: _____

Submitted By: _____

Title: _____

Remarks: _____

IF NOT SUMMITTING A BID, IN ORDER TO REMAIN ACTIVE IN OUR BID VENDOR RECORDS, PLEASE COMPLETE THIS FORM MARKED "NO SUBMITTAL" WITH THE REASON, AND FAX TO (904) 277-7317.

EXHIBIT "B"
TO GENERAL CONDITIONS TO ITB # 13-05

CITY OF FERNANDINA BEACH, FLORIDA SWORN STATEMENT UNDER F.S.
SECTION 287.133(3)(A), ON PUBLIC ENTITY CRIMES

THIS FORM MUST BE SIGNED IN THE PRESENCE OF A NOTARY PUBLIC OR
OTHER OFFICER AUTHORIZED TO ADMINISTER OATHS.

1. This sworn statement is submitted with Bid, Proposal or Contract for _____.
2. This sworn statement is submitted by (entity) _____ whose business address is _____ and (if applicable) Federal Employer Identification Number (FEIN) is _____ (If the entity has no FEIN, include the Social Security Number of the individual signing this sworn statement: _____.)
3. My name is _____ and my relationship to the entity named above is _____.
4. I understand that a "public entity crime" as defined in Paragraph 287.133(a)(g), Florida Statutes, means a violation of any state or federal law by a person with respect to and directly related to the transaction of business with any public entity or with an agency or political subdivision of any other state or with the United States, including, but not limited to, any bid or contract for goods or services to be provided to any public entity or any agency or political subdivision of any other state or of the United States and involving antitrust, fraud, theft, bribery, collusion, racketeering, conspiracy, or material misrepresentation.
5. I understand that "convicted" or "conviction" as defined in paragraph 287.133(a)(b), Florida Statutes, means finding of guilt or a conviction of a public entity crime with or without an adjudication of guilt, in any federal or state trial court of records relating to charges brought by indictment or information after July 1, 1989, as a result of a jury verdict, non-jury trial, or entry of a plea of guilty or nolo contendere.
6. I understand that an "affiliate" as defined in Paragraph 287.133(1)(a), Florida Statutes, means:
 1. A predecessor or successor of a person convicted of a public entity crime; or
 2. An entity under the control of any natural person who is active in the management of the entity and who has been convicted of a public entity crime. The term "affiliate" includes those officers, directors, executives, partners, shareholders, employees, members, and agents who are active in the management of an affiliate. The City of Fernandina Beach, Florida ownership by one of shares constituting a controlling income among persons when not for fair interest in another person, or a pooling of equipment or income among persons when not for fair market value under a length agreement, shall be a prima facie case that one person controls another person. A person who was knowingly convicted of a public entity crime, in Florida during the preceding 36 months shall be considered an affiliate.

7. I understand that a "person" as defined in Paragraph 287.133(1)(e), Florida Statutes, means any natural person or entity organized under the laws of the state or of the United States with the legal power to enter into a binding contract for provision of goods or services let by a public entity, or which otherwise transacts or applies to transact business with a public entity. The term "person" includes those officers, directors, executives, partners, shareholders, employees, members, and agents who are active n management of an entity.

8. Based on information and belief, the statement which I have marked below is true in relation to the entity submitting this sworn statement. (Please indicate which statement applies)

_____ Neither the entity submitting this sworn statement, nor any officers, directors, executives, partners, shareholders, employees, members, or agents who are active in management of the entity, nor affiliate of the entity have been charged with and convicted of a public entity crime subsequent to July 1, 1989.

_____ The entity submitting this sworn statement, or one or more of the officers, directors, executives, partners, shareholders, employees, members, or agents who are active in management of the entity, or an affiliate of the entity has been charged with and convicted of a public entity crime subsequent to July 1, 1989. (Please attach a copy of the final order.)

_____ The person or affiliate was placed on the convicted vendor list. There has been a subsequent proceeding before a hearing officer of the State of Florida, Division of Administrative Hearings. The final order entered by the hearing officer determined that it was in public interest to remove the person or affiliate from the convicted vendor list. (Please attach a copy of the final order.)

_____ The person or affiliate has not been placed on the convicted vendor list. (Please describe any action taken by, or pending with, the Department of General Services.)

Signature

Date:

STATE OF FLORIDA
COUNTY OF _____

PERSONALLY APPEARED BEFORE ME, the undersigned authority, who, after first being sworn by me, affixed his/her signature at the space provided above on this ___ day of _____, 200 ____, and is personally known to me, or has provided _____ as identification.

Notary Public
My Commission expires:

EXHIBIT "D"
ITB 13-05
CITY OF FERNANDINA BEACH



E-VERIFY STATEMENT

Bid/Proposal Number: _____

Project Description: _____

Vendor/Consultant acknowledges and agrees to the following:

Vendor/Consultant shall utilize the U.S. Department of Homeland Security's E-Verify system, in accordance with the terms governing use of the system, to confirm the employment eligibility of:

1. All persons employed by the Vendor/Consultant during the term of the Contract to perform employment duties within Florida; and
2. All persons, including subcontractors, assigned by the Vendor/Consultant to perform work pursuant to the contract with the Department.

Company/Firm: _____

Authorized Signature: _____

Title: _____

Date: _____

EXHIBIT "C"
TO GENERAL CONDITIONS TO ITB # 13-05
CITY OF FERNANDINA BEACH

DRUG-FREE WORKPLACE CERTIFICATION

The below-signed Proposer certifies that it has implemented a drug-free workplace program. In order to have a drug-free workplace prepare, a business shall:

1. Publish a statement notifying employees that the unlawful manufacture, distribution, dispensing, possession, or use of a controlled substance is prohibited in the workplace and specifying the actions that will be taken against employees for violation of such prohibition.
2. Inform employees about the dangers of drug abuse in the workplace, the business's policy of maintaining a drug-free workplace, any available drug counseling, rehabilitation, and employee assistance programs, and the penalties that may be imposed upon employees for drug abuse violations.
3. Give each employee engaged in providing the commodities or services a copy of the statement specified in paragraph 1.
4. In the statement in paragraph 1., notify the employees that, as a condition of working on the commodities or contractual services that are under bid, the employee will abide by the terms of the statement and will notify the employer of any conviction of, or plea of nolo contendere to, any violation occurring in the workplace no later than five (5) working days after such conviction.
5. Impose a sanction on, or require fine satisfactory participation in drug abuse assistance or rehabilitation program if such is available in the employee's community, by any employee who is convicted.
6. Make a good faith effort to continue to maintain a drug-free workplace through implementation of this section.

As the person authorized to sign this statement, I Certify that this firm complies fully with the above drug-free workplace requirements.

COMPANY: _____

CITY: _____ STATE: _____ ZIP CODE: _____

TELEPHONE NUMBER(S): _____

SIGNATURE: _____

NAME (TYPED OR PRINTED): _____ TITLE: _____

STANDARD
GENERAL CONDITIONS
OF THE
CONSTRUCTION CONTRACT
FOR
THE CITY OF FERNANDINA BEACH
FLORIDA

Date: 2000

GENERAL CONDITIONS**ARTICLE I - DEFINITIONS**

Wherever used in these General Conditions or in the other Contract Documents the following terms have the meanings indicated which are applicable to both the singular and plural thereof:

ADDENDA - Written or graphic instruments, explanations, interpretations, changes, corrections, additions, deletions or modifications of the contract documents issued prior to the opening of Bids which clarify, correct or change the bidding documents or the Contract Documents.

AGREEMENT - The written agreement between the CITY and CONTRACTOR covering the Work to be performed; when other Contract Documents are attached to the Agreement, they become a part of the contract. The Agreement is also referred to as the Contract.

APPLICATION FOR PAYMENT - The form accepted by ENGINEER which is to be used by CONTRACTOR in requesting progress or final payments and which is to include such supporting documentation as is required by the Contract Documents.

BID - The offer or proposal of the bidder submitted on the prescribed form setting forth the prices for the Work to be performed, properly signed or guaranteed.

BONDS - Bid, Performance and Payment bonds and other instruments which protect against loss due to inability, failure or refusal of the CONTRACTOR to perform the work specified in the contract documents.

CALENDAR DAY - A calendar day of 24 hours measured from midnight to the next midnight, including Saturdays, Sundays and holidays and regardless of the weather.

CHANGE ORDER - A document recommended by ENGINEER which is signed by the CONTRACTOR

and the CITY which authorizes an addition, deletion, or

revision in the work, or an adjustment in the Contract Price or Contract Time, issued on or after the execution of the Agreement.

CITY - The City of Fernandina Beach, Florida, a Florida municipal corporation, its authorized and legal representatives, the public entity with whom the Contractor has entered into the agreement and for whom the work is to be provided.

CONSTRUCTION SUPERINTENDENT - The construction superintendent shall be in attendance at the project site during performance of the Work and shall represent the CONTRACTOR. Communications given to the construction superintendent or decisions made by the construction superintendent shall be as binding as if given to or made by the CONTRACTOR. Important communications or decisions shall be confirmed in writing. Other communications or decisions shall be similarly confirmed by written request in each case.

CONTRACT DOCUMENTS - The Invitation to Bid, Instructions to Bidders, Proposal, Bid Bond, Agreement, Payment Bond, Performance Bond, Certificate of Insurance, Notice of Tentative Award, Notice to Proceed, Certificate of Substantial Completion, Warranty of Title, Final Receipt - Release of Lien, General Conditions, Supplemental General Conditions, Technical Specifications, Contract Drawings, Addenda and Change Orders executed pursuant to the Contract Documents.

CONTRACT PRICE - The total monies payable by the CITY to the CONTRACTOR under the terms and conditions of the Contract Documents.

CONTRACT TIME - The number of successive calendar days stated in the Contract Documents for the completion of the Work.

CONTRACTOR - The person, firm, or corporation with whom the CITY has executed the Agreement to

furnish the Work called for in the Contract Documents.

DEFECTIVE WORK - Work that is unsatisfactory, faulty, or deficient; or that does not conform to the Contract Documents; or that does not meet the requirements of any inspection, reference standard, test, or approval referred to in the Contract Documents; or Work that has been damaged prior to the ENGINEER'S recommendation of final payment.

DRAWINGS - The drawings, plans, maps, profiles, diagrams, and other graphic representations which show character, location, nature, extent and scope of the Work, which have been prepared or approved by ENGINEER and which are considered part of the Contract Documents.

EFFECTIVE DATE OF THE AGREEMENT - The date indicated in the Agreement, but if no such date is indicated it means the date on which the Agreement is signed by the last of the two parties to sign the Agreement.

ENGINEER(S) - City of Fernandina Beach or its authorized agents, inspectors or representatives acting within the scope of duties entrusted to them by the CITY.

FIELD ORDER - A written order by the ENGINEER that does not impact the cost or time of performance of the Work.

GENERAL REQUIREMENTS - Division I of the Technical Specifications.

LAWS AND REGULATIONS; LAWS OR REGULATIONS - Laws, rules, codes, regulations, ordinances and/or orders promulgated by a lawfully constituted body authorized to issue such Laws and Regulations.

NOTICE OF AWARD - The official written notice by the CITY to the apparent successful bidder stating that upon compliance by the apparent successful bidder with the conditions precedent enumerated therein within the time specified, the CITY may enter into an Agreement.

NOTICE TO PROCEED - The written notice issued by the CITY, or it's agents, to the CONTRACTOR authorizing the CONTRACTOR to proceed with the

Work and establishing the date of commencement of the Contract Time.

PARTIAL UTILIZATION - Placing a portion of the Work in service for the purpose for which it is intended (or a related purpose) before reaching Substantial Completion for all the Work.

PROJECT - The entire construction to be performed as provided in the Contract Documents.

RESIDENT PROJECT REPRESENTATIVE (RPR) - The resident project representative, shall be in attendance at the project site during performance of the Work and shall represent the CITY directly or through the ENGINEER. Responsibilities of the RPR are further defined in Paragraph 9.3 of these General Conditions.

SHOP DRAWINGS - All drawings, diagrams, illustrations, schedules, and other data which are specifically prepared by or for the CONTRACTOR to illustrate some portion of the Work, and all illustrations, brochures, standard schedules, performance charts, instructions, diagrams and other information prepared by a supplier and submitted by the CONTRACTOR to illustrate material or equipment for some portion of the Work.

SPECIFICATIONS - (Same definition as for Technical Specifications hereinafter).

SUBCONTRACTOR - An individual, firm, or corporation having a direct contract with the CONTRACTOR or with any other Subcontractor for the performance of a part of the Work at the Site.

SUBSTANTIAL COMPLETION - The Work (or a specified part thereof) has progressed to the point where, in the opinion of ENGINEER as evidenced by ENGINEER'S definitive certificate of Substantial Completion, it is sufficiently complete, in accordance with the Contract Documents, so that the Work (or specified part) can be utilized for the purposes for which it is intended. The terms "substantially complete" and "substantially completed" as applied to any Work refer to Substantial Completion thereof. When the entire Project is considered to be Substantially Complete, this does not constitute Final Acceptance or Final Completion of the entire Project.

SUPPLEMENTARY CONDITIONS - The part of the Contract Documents which amends or supplements these General Conditions.

SUPPLIER - A manufacturer, fabricator, supplier, distributor, materialman or vendor.

SURETY - Any person, firm or corporation which is bound by bid or contract bond with and for the CONTRACTOR.

TECHNICAL SPECIFICATIONS - Those portions of the Contract Documents consisting of the General Requirements and written technical descriptions of products and execution of the Work.

UNDERGROUND FACILITIES - All pipelines, conduits, ducts, cables, wires, manholes, vaults, tanks, tunnels or other such facilities or attachments, and any encasements containing such facilities which have been installed underground to furnish any of the following services or materials: electricity, gases, steam, liquid petroleum products, telephone or other communications, cable television, water supply or distribution, sewage and drainage removal, traffic or other control systems.

UNIT PRICE WORK - Work to be paid for on the basis of unit prices.

WORK - Any and all obligations, duties and responsibilities necessary to the successful completion of the Project assigned to or undertaken by the CONTRACTOR under the Contract Documents, including all labor, materials, equipment and other incidentals and the furnishing thereof.

WORK DIRECTIVE CHANGE - A written directive to CONTRACTOR, issued on or after the Effective Date of the Agreement and signed by the CITY and recommended by the ENGINEER, ordering an addition, deletion or revision in the Work, or which references an emergency or unforeseen physical conditions under which the Work is to be performed. A Work Directive Change may not change the Contract Price or the Contract Time, but is evidence that the parties expect that the change directed or documented by a Work Directive Change will be incorporated in a subsequently issued Change Order following negotiations by the parties as to its effect, if any, on the Contract Price or Contract Time.

WRITTEN AMENDMENT - A written amendment of the Contract Documents, signed by the CITY and CONTRACTOR on or after the Effective Date of the Agreement and normally dealing with the non-engineering or non-technical rather than strictly Work-related aspects of the Contract Documents.

ARTICLE 2 - PRELIMINARY MATTERS

DELIVERY OF DOCUMENTS:

2.1. When the CONTRACTOR delivers the signed Agreements to the CITY, the CONTRACTOR shall also deliver to the CITY such Bonds and Insurance Policies, Certificates or other documents as the CONTRACTOR may be required to furnish in accordance with the Contract Documents.

COPIES OF DOCUMENTS:

2.2. The CITY shall furnish to CONTRACTOR three copies (unless otherwise specified in the Supplementary Conditions) of the Contract Documents or as are reasonably necessary for the execution of the Work. Additional copies will be furnished, upon request, at the cost of reproduction.

COMMENCEMENT OF CONTRACT TIME; NOTICE TO PROCEED:

2.3. The Contract Time will commence to run on the day indicated in any Notice to Proceed. A Notice to Proceed may be given at any time within sixty days after the Effective Date of the Agreement.

STARTING THE PROJECT:

2.4. CONTRACTOR shall start to perform the Work on the date when the Contract Time commences to run, but no Work shall be done at the site prior to the date on which the Contract time commences to run.

BEFORE STARTING CONSTRUCTION:

2.5. Before undertaking each part of the Work, CONTRACTOR shall carefully study and compare the Contract Documents and check and

verify pertinent figures shown thereon and all applicable field measurements. CONTRACTOR shall promptly report in writing to ENGINEER any conflict, error, ambiguity or discrepancy which CONTRACTOR may discover and shall obtain a written interpretation or clarification from ENGINEER before proceeding with any Work affected thereby; however, CONTRACTOR shall not be liable to CITY or ENGINEER for failure to report any conflict, error, ambiguity or discrepancy in the Contract Documents, unless CONTRACTOR knew or reasonably should have known thereof.

2.6. At the pre-construction conference, CONTRACTOR shall submit to ENGINEER for review:

2.6.1. a proposed progress schedule indicating the starting and completion dates of the various stages of the Work; and,

2.6.2. a preliminary schedule of Shop Drawing submissions and those shop drawings necessary to begin the work; and,

2.6.3. a preliminary schedule of values for all of the Work which will include quantities and prices of items aggregating the Contract Price and will subdivide the Work into component parts in sufficient detail to serve as the basis for progress payments during construction. Such prices will include an appropriate amount of overhead and profit applicable to each item of Work which will be confirmed in writing by CONTRACTOR at the time of submission ;and,

2.6.4. Pre-construction video tapes if required by the technical specifications

2.7. The CONTRACTOR shall not commence construction operations until the construction progress schedule, schedule of values and the shop drawing submission schedule described above have been reviewed by the ENGINEER for general conformance with the Contract documents. After review of the schedules, no deviation shall be made without prior written acceptance by the CITY for general conformance with the Contract Documents.

PRECONSTRUCTION CONFERENCE:

2.8. After the Effective Date of the Agreement, but before CONTRACTOR starts Work at the site, a conference attended by CONTRACTOR, ENGINEER and others as deemed appropriate by the CITY, ENGINEER, or CONTRACTOR will be held to discuss the schedules referred to in paragraph 2.6, to discuss procedures for handling Shop Drawings and other submittals and for processing Applications for Payment, and to establish a working understanding among the parties as to the Work. Nothing herein shall relieve the CONTRACTOR from the responsibility of contacting local utilities and any other necessary agencies.

FINALIZING SCHEDULES:

2.9. At least ten days before submission of the first Application for Payment a conference attended by CONTRACTOR, CITY, ENGINEER and others as appropriate will be held to finalize the schedules submitted in accordance with paragraph 2.6. The finalized progress schedule will be acceptable to the CITY as providing an orderly progression of the Work to completion within the Contract Time, but such acceptance will neither impose on the CITY responsibility for the progress or scheduling of the Work nor relieve CONTRACTOR from full responsibility therefor. The finalized schedule of Shop Drawing submissions will be acceptable to the CITY as providing a workable arrangement for processing the submissions. The finalized schedule of values will be acceptable to the CITY as to form and substance.

ARTICLE 3 - CONTRACT DOCUMENTS: INTENT, AMENDING, REUSE

INTENT:

3.1. The Contract Documents comprise the entire agreement between the CITY and CONTRACTOR concerning the Work. The Contract

Documents are complementary: what is called for by one is as binding as if called for by all. The Contract Documents will be construed in accordance with the laws of the State of Florida with venue in Pinellas County, Florida.

3.2. It is the intent of the Contract Documents to describe a functionally complete Project (or part thereto) to be constructed in accordance with the Contract Documents. Any Work, materials or equipment that may reasonably be inferred from the Contract Documents as being required to produce the intended result shall be supplied whether or not specifically called for. When words which have a well-known technical or trade meaning are used to describe Work, materials or equipment such words shall be interpreted in accordance with that meaning. Reference to standard specifications, manuals or codes of any technical society, organization or association, or to the Laws or Regulations of any governmental authority, whether such reference be specific or by implication, shall mean the latest standard specification, manual, code or Laws or Regulations in effect at the time of opening of Bids, except as may be otherwise specifically stated. However, no provision of any referenced standard specification, manual or code (whether or not specifically incorporated by reference in the Contract Documents) shall be effective to change the duties or responsibilities of the CITY, CONTRACTOR or ENGINEER or any of their consultants, agents or employees from those set forth in the Contract Documents, nor shall it be effective to assign to ENGINEER'S, agents or employees, any duty or authority to supervise or direct the furnishing or performance of the Work or any duty or authority to undertake responsibility contrary to the provisions of paragraph 9.15 or 9.16. Clarifications and interpretations of the Contract Documents shall be issued by the ENGINEER as provided in paragraph 9.4.

3.3. If, during the performance of the Work, CONTRACTOR finds a conflict, error or discrepancy in the Contract Documents, CONTRACTOR shall so notify the ENGINEER, in writing, at once and before proceeding with the Work affected thereby shall obtain a written interpretation or clarification. In resolving conflicts resulting from errors or discrepancies in any of the Contract Documents, the order of precedence shall be as follows:

1. Change Order
2. Addenda
3. Agreement
4. Proposal
5. Supplemental General Conditions
6. Invitation to Bid
7. Instructions to Bidders
8. General Conditions
9. Technical Specifications
10. Contract Drawings
 - a. Dimensions
 - b. Full Size Details
 - c. Full Size Drawings

The captions or subtitles of the several articles and divisions of these Contract Documents constitute no part of the context and hereof, but are only labels to assist in locating and reading the provisions hereof.

AMENDING AND SUPPLEMENTING CONTRACT DOCUMENTS:

3.4. The Contract Documents may be amended to provide for additions, deletions and revisions in the Work or to modify the terms and conditions thereof in one or more of the following ways:

3.4.1. a formal Written Amendment.

3.4.2. a Change Order (pursuant to paragraph 10.4), or

3.4.3. a Work Directive Change (pursuant to paragraph 10.1).

As indicated in paragraphs 11.2 and 12.1, Contract Price and Contract Time may only be changed by a Change Order or by a Written Amendment.

3.5. In addition, the requirements of the Contract Documents may be supplemented, and minor variations and deviations in the Work may be authorized, in one or more of the following ways:

3.5.1. a Field Order (pursuant to paragraph 9.5)

3.5.2. ENGINEER'S approval of a Shop Drawing or sample (pursuant to paragraphs 6.26 and 6.27), or

3.5.3. ENGINEER'S written interpretation or clarification (pursuant to paragraph 9.4).

REUSE OF DOCUMENTS:

3.6. Neither CONTRACTOR nor any Subcontractor or Supplier or other person or organization performing or furnishing any of the Work under a direct or indirect contract with the CITY shall have or acquire any title to or ownership rights in any of the Contract Documents, drawings, technical specifications or other documents used on the work; and, they shall not reuse any of them on extensions of the Project or any other project without prior written consent of the CITY and ENGINEER.

ARTICLE 4 - AVAILABILITY OF LANDS; PHYSICAL CONDITIONS; REFERENCE POINTS

AVAILABILITY OF LANDS:

4.1. The CITY shall furnish, as indicated in the Contract Documents, the lands upon which the Work is to be performed, rights-of-way and easements for access thereto and such other lands which are designated for the use of CONTRACTOR. Easements for permanent structures or permanent changes in existing facilities will be obtained and paid for by the CITY, unless otherwise provided in the Contract Documents. If CONTRACTOR believes that any delay in the CITY'S furnishing these lands, rights-of-way or easements entitles CONTRACTOR to an extension of the Contract Time, CONTRACTOR may make a claim therefor as provided in Article 12. CONTRACTOR shall provide for all additional lands and access thereto that may be required for temporary construction facilities or storage of materials and equipment.

4.1.1. Occupying Private Land: The Contractor shall not (except after written consent from the proper parties) enter or occupy with men, tools, equipment or materials, any land outside the rights-of-way or property of the City. A copy of the written consent shall be given to the CITY.

4.1.2. Work in State, County and City Rights-of-Way and Easements: When the Work involves the installation of sanitary sewers, storm sewers, drains, water mains, manholes, underground structures, or other disturbances of existing features in or across street, rights-of-way, easements, or other property, the CONTRACTOR shall (as the Work progresses) promptly back-fill, compact, grade and otherwise restore the disturbed area to a basic condition which will permit resumption of pedestrian or vehicular traffic and any other critical activity or function consistent with the original use of the land. Unsightly mounds of earth, large stones, boulders, and debris shall be removed so that the site presents a neat appearance.

4.1.3. Work Adjacent to Telephone, Power, Cable TV and Gas Company Structures: In all cases where Work is to be performed near telephone, power, water, sewer, drainage, cable TV, or gas company facilities, the Contractor shall provide written notification to the respective companies of the areas of which Work is to be performed, prior to the actual performance of any Work in these areas.

4.1.4. Use of Public Streets: The use of public streets and alleys shall be such as to provide a minimum of inconvenience to the public and to other vehicular and non-vehicular traffic. Any earth or excavated material spilled from trucks shall be removed by the CONTRACTOR and the streets cleaned to the satisfaction of the CITY, the ENGINEER, the Florida Department of Transportation, or other agency or governmental entity having jurisdiction, as applicable.

PHYSICAL CONDITIONS:

4.2.1. Explorations and Reports: Where applicable, reference is made in the technical specifications, for identification of those reports of explorations and tests of subsurface conditions at the site that have been utilized by

ENGINEER in preparation of the Contract Documents. CONTRACTOR accepts the site and any unforeseen conditions in accordance with paragraph 4.4 of the Instructions to Bidders, and may rely upon the accuracy of the technical data contained in such reports, but not upon non-technical data, interpretations, or opinions contained therein or for the completeness for CONTRACTOR'S purposes, including, but not limited to, any aspects of the means, methods, techniques, sequences and procedures of construction to be employed by CONTRACTOR and safety precautions and programs incident thereto. Except as indicated in the immediately preceding sentence and in paragraph 4.2.6, CONTRACTOR shall have full responsibility with respect to subsurface conditions at the site.

4.2.2. Existing Structures: Where applicable, reference is made to the technical specifications, for identification of those drawings of physical conditions in or relating to existing surface and subsurface structures (except Underground Facilities referred to in paragraph 4.3.1) which are at or contiguous to the site that have been utilized by ENGINEER in preparation of the Contract Documents. CONTRACTOR may rely upon the general accuracy of the technical data contained in such drawings, but not for the completeness thereof for CONTRACTOR'S purposes including, but not limited to, any aspects of the means, methods, techniques, sequences and procedures of construction to be employed by CONTRACTOR and safety precautions and programs incident thereto. Except as indicated in the immediately preceding sentence and in paragraph 4.2.6, CONTRACTOR shall have full responsibility with respect to physical

conditions in or relating to such structures. However, where the dimensions and locations of existing structures are of critical importance in the installation or connection of new work, the CONTRACTOR shall verify such dimensions and locations in the field before the fabrication of any materials or equipment which is dependent on the correctness of such information. There shall be no additional cost to the CITY for CONTRACTOR'S failure to verify such dimensions and locations, or for inaccurate verifications by CONTRACTOR.

4.2.3. Report of Differing Conditions: If CONTRACTOR believes that:

4.2.3.1. Any technical data on which CONTRACTOR is entitled to rely as provided in paragraphs 4.2.1 and 4.2.2 is inaccurate, or

4.2.3.2. Any physical condition uncovered or revealed at the site differs materially from that indicated, reflected or referred to in the Contract Documents, CONTRACTOR shall, promptly after becoming aware thereof and before performing any Work in connection therewith (except in an emergency as permitted by paragraph 6.22.1), notify the CITY and the ENGINEER in writing about the inaccuracy or difference.

4.2.4. ENGINEER'S Review: ENGINEER will promptly review the pertinent conditions, determine the necessity of obtaining additional explorations or tests with respect thereto and advise the CITY in writing (with a copy to the CONTRACTOR) of ENGINEER'S findings and conclusions.

4.2.5. Possible Document Change: If ENGINEER concludes that there is a material error in the Contract Documents or that because of newly discovered conditions a change in the Contract Documents is required, a Work Directive Change or a Change Order will be issued as provided in Article 10 to reflect and document the consequences of the inaccuracy or difference.

4.2.6. Possible Price and Time Adjustments: In each such case, an increase or decrease in the Contract Price or an extension or shortening of the Contract Time, or any combination thereof, will be allowable to the extent that they are attributable to any such inaccuracy or difference. If the CITY and CONTRACTOR are unable to agree as to the amount or length thereof, a claim may be made therefore as provided in Article 11 and 12.

PHYSICAL CONDITIONS - UNDERGROUND FACILITIES:

4.3.1. The information and data shown or indicated in the Contract Documents with respect to existing Underground Facilities at or contiguous to the site is based on information and data furnished to the CITY or ENGINEER by the owners of such Underground Facilities or by others.

4.3.1.1. The CITY and ENGINEER shall not be responsible for the accuracy or completeness of any such information or data; and,

4.3.1.2. CONTRACTOR shall have full responsibility for reviewing and checking all such information and data. Further, the CONTRACTOR shall be responsible for locating all Underground Facilities whether or not shown or indicated in the Contract Documents, for coordination of the Work with the owners of such Underground Facilities during construction, for the safety and protection thereof as provided in paragraph 6.20, and repairing any damage thereto resulting from the Work, the cost of all of which will be considered as having been included in the Contract Price.

4.3.1.3. All water pipes, sanitary sewers, storm drains, force mains, gas mains, or other pipe, telephone or power cables or conduits, pipe or conduit casings, curbs, sidewalks, service lines and all other obstructions, whether or not shown, shall be temporarily removed from or

supported across utility line excavations. Where it is necessary to temporarily interrupt services, the CONTRACTOR shall notify the owner or occupant of such facilities both before the interruption and again immediately before service is resumed. Before disconnecting any pipes or cables, the CONTRACTOR shall obtain permission from their owner, or shall make suitable arrangements for their disconnection by their owner. The CONTRACTOR shall be responsible for any damage to any such pipes, conduits or cables, and shall restore them to service promptly as soon as the Work has progressed past the point involved. Approximate locations of known water, sanitary, drainage, natural gas, power, telephone and cable TV installations along the route of new pipelines or in the vicinity of new work are shown, but are to be verified in the field by the Contractor prior to performing the work. The CONTRACTOR shall uncover these pipes, ducts, cables, etc., carefully, by hand prior to installing his Work. Any discrepancies or differences found shall be immediately brought to the attention of the ENGINEER in order that necessary changes may be made to permit installation of the Work.

4.3.2. If an Underground Facility is uncovered or revealed at or contiguous to the site which was not shown, nor located by the facilities owner and which CONTRACTOR could not reasonably have been expected to be aware of, CONTRACTOR shall, promptly after becoming aware thereof and before performing any Work affected thereby (except in an emergency as permitted by paragraph 6.22.1), identify the owner of such Underground Facility and give written notice thereof to that owner and to the CITY and the ENGINEER. The ENGINEER will promptly review the Underground Facility to determine the extent to which the Contract Documents should be modified to reflect and document the consequences of the existence of the Underground Facility, and the Contract

Documents will be amended or supplemented to the extent necessary. During such time, CONTRACTOR shall be responsible for the safety and protection of such Underground Facility as provided in paragraph 6.20.

4.3.3. CONTRACTOR shall only be allowed an increase in the Contract Price or an extension of the Contract Time, or both, to the extent that they are attributable to the existence of any such Underground Facility CONTRACTOR could not reasonably have been expected to have been aware of. If the parties are unable to agree as to the amount or length thereof, CONTRACTOR may make a claim therefor as provided in Articles 11 and 12.

REFERENCE POINTS:

4.4. The CITY shall provide engineering surveys to establish reference points for construction which in ENGINEER'S judgment are necessary to enable CONTRACTOR to proceed with the Work. CONTRACTOR shall be responsible for laying out the Work (unless otherwise specified in the General Requirements), shall protect and preserve the established reference points and shall make no changes or relocations without the prior written approval of the CITY. The CONTRACTOR shall report to the ENGINEER whenever any reference point is lost or destroyed or requires relocation because of necessary changes in grades or locations, and shall be responsible for the accurate replacement or relocation of such reference points by professionally qualified personnel.

ARTICLE 5 - BONDS AND INSURANCE

BONDS:

5.1. CONTRACTOR shall upon delivery of the executed Agreement to the CITY furnish Performance and Payment Bonds, each in an amount at least equal to the Contract Price as security for the faithful performance and payment of all

CONTRACTOR'S obligations under the Contract Documents. These Bonds shall remain in effect at least until one year after the date when final payment becomes due, except as otherwise provided by Law or Regulation or by the Contract Documents. CONTRACTOR shall also furnish such other Bonds as are required by the Supplementary Conditions. The form and conditions of the Bonds and the Surety shall be acceptable and satisfactory to the CITY and Surety shall be a nationally recognized Surety Company acceptable to the CITY, listed on the current list of "Companies Holding Certificates of Authority as Acceptable Sureties on Federal Bonds and Acceptable Reinsuring Companies" as published in Circular 570 (amended) by the Audit Staff, Bureau of Government Financial Operations, U.S. Treasury Department, for projects not exceeding (\$500,000) five hundred thousand dollars and meet the other requirements of Florida Statutes Section 287.0935 (1989). For projects exceeding five hundred thousand dollars, all bonds shall be placed with sureties with a Best Rating of no less than A-IX. Bonds shall be executed and issued by a resident agent, licensed and having an office in Florida, representing such corporate sureties. If the CONTRACTOR is a partnership, the Bond should be signed by each of the individuals who are partners; if a corporation, the Bond should be signed in the correct corporate name by duly authorized officer, agent or attorney-in-fact. There should be executed an appropriate number of counterparts of the bond corresponding to the number of counterparts in the Contract. Each executed bond should be accompanied by (a) appropriate acknowledgment of the respective parties; (b) appropriate duly certified copy of Power-of-Attorney or other certification of authority where bond is executed by agent, officer or other representative of Contractor or Surety; (c) duly certified extract from by-laws or resolutions of Surety under which Power-of-Attorney, or other certificate of Authority of its agent, officer or representative was issued.

5.2. If the surety on any Bond furnished by CONTRACTOR is declared bankrupt or becomes insolvent or its right to do business is terminated in the state of Florida or it ceases to meet the requirements of paragraph 5.1., CONTRACTOR shall within five days thereafter substitute another Bond and Surety, both of which must be in conformance with paragraph 5.1.

CONTRACTOR'S INSURANCE:

5.3. General: CONTRACTOR shall purchase and maintain such comprehensive general liability and other insurance as is appropriate for the Work being performed and furnished and as will provide protection from claims set forth below which may arise out of or result from CONTRACTOR'S performance and furnishing of the Work and CONTRACTOR'S other obligations under the Contract Documents, whether it is to be performed or furnished by CONTRACTOR, by any Subcontractor, by anyone directly or indirectly employed by any of them to perform or furnish any of the Work, or by anyone for whose acts any of them may be liable. Before starting and during the term of this Contract, the CONTRACTOR shall procure and maintain insurance of the types and to the limits specified in paragraph 5.4, inclusive below.

5.4. Coverage: Except as otherwise stated, the amounts and types of insurance shall conform to the following minimum requirements:

5.4.1. Workers' Compensation. Coverage to apply for all employees for Statutory Limits in compliance with the applicable State and Federal laws. CONTRACTOR shall require all subcontractors to maintain workers compensation during the term of the agreement and up to the date of final acceptance. CONTRACTOR shall defend, indemnify and save the CITY and ENGINEER harmless from any damage resulting to them for failure of either CONTRACTOR or any subcontractor to take out or maintain such insurance.

5.4.1.1. Employers' Liability with Statutory Limits of \$100,000/\$500,000/\$100,000.

5.4.1.2. Notice of Cancellation and/or Restriction. The policy must be endorsed to provide the City with thirty (30) days' written notice of cancellation and/or restriction.

5.4.1.3. If any operations are to be undertaken on or about navigable waters, coverage must be

included for the U.S. Longshoremen and Harbor Workers Act and/or Jones Act if applicable.

5.4.2. Comprehensive General Liability or Commercial General Liability Coverage must be afforded on a form no more restrictive than the latest edition of the Comprehensive General Liability Policy or Commercial General Liability filed by the Insurance Services Office, and must include:

5.4.2.1. Minimum Limits of total coverage shall be \$1,000,000.00 per occurrence combined single limit for Bodily Injury Liability and Property Damage Liability, the basic policy to be in said form with any excess coverage (and the carrier) to meet \$1,000,000.00 minimum to be acceptable to the CITY.

5.4.2.2. Premises and/or Operations.

5.4.2.3. Independent Contractor.

5.4.2.4. Products and/or Completed Operations. CONTRACTOR shall maintain in force until at least three (3) years after completion of all services required under the Contract, coverage for products and completed operations, including Broad Form Property Damage.

5.4.2.5. XCU Coverages.

5.4.2.6. Broad Form Property Damage including Completing Operations.

5.4.2.7. Broad Form Contractual Coverage applicable to this specific Contract, including any hold harmless and/or indemnification agreement.

5.4.2.8. Personal Injury coverage with employees and contractual exclusions removed.

5.4.2.9. Additional Insured. The CITY is to be specifically included as an additional insured (including products).

5.4.2.10. Notice of Cancellation and/or Restriction. The policy must be endorsed to provide the City with thirty (30) days' written notice of cancellation and/or restriction.

5.4.2.11. The CONTRACTOR shall either require each subcontractor to procure and maintain, during the life of the subcontract, insurance of the type and in the same amounts specified herein or insure the activities of subcontractors in his own insurance policy.

5.4.3. Business Auto Policy. Coverage must be afforded on a form no more restrictive than the latest edition of the Business Auto Policy filed by the Insurance Service Office and must include:

5.4.3.1. Minimum limit of \$1,000,000.00 per occurrence combined single limit for Bodily Injury Liability and Property Damage Liability.

5.4.3.2. Owned Vehicles.

5.4.3.3. Hired and Non-Owned Vehicles

5.4.3.4. Employee Non-Ownership

5.4.3.5. Notice of Cancellation and/or Restriction. The policy must be endorsed to provide the City with thirty (30) days' written notice of cancellation and/or restriction.

5.4.4. All Risk Property Insurance - When Applicable. Coverage must include real and personal property and in an amount equal to the replacement cost of all real and personal property of the CITY'S for which the CONTRACTOR is responsible and over which he exercises control. Builders Risk insurance must be provided to cover Property under construction and an Installation Floater must cover all machinery, vessels, air conditioners or electric generators to be installed. This insurance shall include a waiver of subrogation as to the ENGINEER, the CITY, the CONTRACTOR, and their respective officers, agents, employees, and subcontractors.

5.4.4.1. Coverage to be provided on a full replacement cost basis.

5.4.4.2. Losses in excess of ten thousand dollars (\$10,000) shall be jointly payable to the CONTRACTOR and the CITY.

5.4.4.3. Waiver of occupancy clause or warranty. Policy must be specifically endorsed to eliminate any "Occupancy Clause" or similar warranty or representation that the building(s), addition(s) or structure(s) will not be occupied by the CITY.

5.4.4.4. Maximum Deductible - \$5,000 each claim.

5.4.4.5. Copy of Policy. A certified copy of the policy must be provided to the CITY prior to the commencement of work.

5.4.4.6. Named Insured. The CITY must be included as a named insured.

5.4.4.7. Notice of Cancellation and/or Restriction. The policy must be endorsed to provide the City with thirty (30) days' written notice of cancellation and/or restriction.

5.4.4.8. Flood Insurance.

When the buildings or structures are located within an identified special flood hazard area, flood insurance protecting the interest of the CONTRACTOR and the CITY must be afforded for the lesser of the total insurable value of such buildings or structures, or, the maximum amount of flood insurance coverage available under the National Flood Program.

5.4.5. A Best Rating of no less than A - VIII is required for any carriers providing coverage required under the terms of this Contract. Failure to comply with the insurance requirements as herein provided shall constitute default of this Agreement. Neither CONTRACTOR or any subcontractor shall commence work under the Contract until they have all insurance required under this Section and have supplied the CITY with evidence of such coverage in the form of certified copies of policies (where required) and certificates of insurance, and such policies and certificates have been approved by the CITY. CONTRACTOR shall be responsible for and shall obtain and file insurance certificates on behalf of its subcontractors. All certified copies of policies and certificates of insurance shall be filed with the CITY.

ARTICLE 6 - CONTRACTOR'S RESPONSIBILITIES

SUPERVISION AND SUPERINTENDENCE:

6.1. The CONTRACTOR has the obligation to deliver to the CITY the completed job in a good and workmanlike condition. CONTRACTOR shall supervise and direct the Work completely and efficiently, devoting such attention thereto and applying such skills and expertise as may be necessary to perform the Work in accordance with the Contract Documents. CONTRACTOR shall be solely responsible for the means, methods, techniques, sequences and procedures of construction, but CONTRACTOR shall not be responsible for the

negligence of others in the design or selection of a specific means, method, technique, sequence or procedure of construction which is required by the Contract Documents. CONTRACTOR shall be responsible to see that the finished Work complies accurately with the Contract Documents. The CONTRACTOR shall bear all losses resulting on account of the weather, fire, the elements, or other causes of every kind or nature prior to Final Acceptance. The supervision of the execution of this contract is vested wholly in the CONTRACTOR.

6.2. The superintendent will be CONTRACTOR'S representative at the site and shall have authority to act on behalf of CONTRACTOR. All communications given to the superintendent shall be as binding as if given to CONTRACTOR.

LABOR, MATERIALS AND EQUIPMENT; HOURS OF WORK:

6.3. CONTRACTOR shall provide competent, suitably qualified personnel to survey and lay out the Work and perform construction as required by the Contract Documents. CONTRACTOR shall at all times maintain good discipline and order at the site. Except in connection with the safety or protection of persons or the Work or property at the site or adjacent thereto, and except as otherwise indicated in the Contract Documents, all Work at the site shall be performed during regular working hours, and CONTRACTOR will not permit overtime work or the performance of Work on Saturday, Sunday or any legal holiday without the CITY'S written consent (which shall not be unreasonably withheld) given after prior written notice to ENGINEER. The CONTRACTOR is hereby informed, and understands that unless otherwise approved by the City, the City restricts the work between the hours of 5:00 p.m. and 8:00 a.m., unless emergency conditions exist that are endangering life or property as may be determined by the CITY. If the CONTRACTOR is authorized to operate equipment twenty-four (24) hours per day, the engines shall be provided with residential type silencers approved by the CITY.

6.3.1 The CONTRACTOR shall receive no additional compensation for overtime work. However, additional compensation will be paid to the CONTRACTOR for overtime work only in the

event extra work is ordered by the ENGINEER and the change order specifically authorizes the use of overtime work and then only to such extent as overtime wages are regularly being paid by the CONTRACTOR for overtime work of a similar nature in the same locality.

6.3.2 All costs of inspection and testing performed by the CITY during overtime work by the CONTRACTOR which is allowed solely for the convenience of the CONTRACTOR shall be borne by the CONTRACTOR. The CITY shall have the authority to deduct the cost of all such inspection and testing from any partial payments otherwise due to the CONTRACTOR. For all work performed on holidays and weekends a fee of \$250 per day will be charged to the CONTRACTOR, to cover the cost of Fernandina Beach Engineering Inspectors. Notice must be submitted at least two whole working days prior to subsequent holiday and/or weekend.

6.4. Unless otherwise specified in the General Requirements, CONTRACTOR shall furnish and assume full responsibility for all materials, equipment, labor, transportation, construction equipment and machinery, tools, appliances, fuel, power, light, heat, telephone, water, sanitary facilities, temporary facilities and all other facilities and incidentals necessary for the furnishing, performance, testing, start-up and final completion of the work.

6.5. All materials and equipment shall be of good quality and new, except as otherwise provided in the Contract Documents. If required by ENGINEER, CONTRACTOR shall furnish satisfactory evidence (including reports of required tests) as to the kind and quality of materials and equipment. All materials and equipment shall be applied, installed, connected, erected, used, cleaned

and conditioned in accordance with the instructions of the applicable Supplier except as otherwise provided in the Contract Documents; but no provision of any such instructions will be effective to assign to the CITY, ENGINEER, or any of the CITY'S or ENGINEER'S consultants, agents or employees, any duty or authority to supervise or direct the furnishing or performance of the Work or any duty or authority to undertake responsibility contrary to the provisions of paragraph 9.15 or 9.16.

ADJUSTING PROGRESS SCHEDULE:

6.6. CONTRACTOR shall submit to ENGINEER for review and comment (to the extent indicated in paragraph 2.9) adjustments in the progress schedule to reflect the impact thereon of new developments; these will conform generally to the progress schedule then in effect and additionally will comply with any provisions of the General Requirements applicable thereto.

SUBSTITUTES OR "OR-EQUAL" ITEMS:

6.7.1. The technical specifications shall govern the use of substitute or "or-equal" items. The procedure for review by ENGINEER will include the following as supplemented in the technical specifications. Requests for review of substitute items of material and equipment will not be accepted by ENGINEER from anyone other than CONTRACTOR. If CONTRACTOR wishes to furnish or use a substitute item of material or equipment, CONTRACTOR shall make written application to ENGINEER for acceptance thereof, certifying that the proposed substitute will perform equally or better the functions and achieve the results called for by the general design, be similar and of equal substance to that specified and be suited to the same use as that specified. The application will state that the evaluation and acceptance of the proposed substitute will not prejudice CONTRACTOR'S achievement of Substantial Completion on time, whether or not acceptance of the substitute for use in the Work will require a change in any of the Contract Documents (or in the provisions of any other

direct contract with the CITY for work on the Project) to adapt the design to the proposed substitute and whether or not incorporation or use of the substitute in connection with the Work is subject to payment of any license fee or royalty. All variations of the proposed substitute from that specified will be identified in the application and available maintenance, repair and replacement service will be indicated. The application will also contain an itemized estimate of all costs that will result directly or indirectly from acceptance of such substitute, including costs of redesign and claims of other contractors affected by the resulting change, all of which shall be considered by ENGINEER in evaluating the proposed substitute. ENGINEER may require CONTRACTOR to furnish at CONTRACTOR'S expense additional data about the proposed substitute.

6.7.2. If a specific means, method, technique, sequence or procedure of construction is indicated in or required by the Contract Documents, CONTRACTOR may furnish or utilize a substitute means, method, sequence, technique or procedure of construction acceptable to ENGINEER, if CONTRACTOR submits sufficient information to allow ENGINEER to determine that the substitute proposed is equivalent to that indicated or required by the Contract Documents. The procedure for review by ENGINEER will be similar to that provided in paragraph 6.7.1 as applied by ENGINEER and as may be supplemented in the Technical Specifications.

6.7.3. ENGINEER will be allowed a reasonable time within which to evaluate each proposed substitute. ENGINEER will be the sole judge of acceptability, and no substitute will be ordered, installed or utilized without ENGINEER'S prior written acceptance which will be evidenced by either a Change Order or an approved Shop Drawing. The CITY may require the CONTRACTOR to furnish at CONTRACTOR'S expense a special performance guarantee or other surety with respect to any substitute.

CONCERNING SUBCONTRACTORS, SUPPLIERS AND OTHERS:

6.8.1. CONTRACTOR shall not employ any Subcontractor, Supplier or other person or organization (including those acceptable to the CITY and the ENGINEER as indicated in paragraph 6.8.2), whether initially or as a substitute, against whom the CITY or the ENGINEER may have reasonable objection. CONTRACTOR shall not be required to employ any Subcontractor, Supplier or other person or organization to furnish or perform any of the Work against whom CONTRACTOR has reasonable objection.

6.8.2. If the Technical Specifications or Contract Documents require the identity of certain Subcontractors, Suppliers or other persons or organizations (including those who are to furnish the principal items of materials and equipment) shall be submitted to the CITY for acceptance by the CITY and ENGINEER, and if CONTRACTOR has submitted a list thereof, the CITY or ENGINEER'S acceptance (either in writing or by failing to make written objection thereto by the date indicated for acceptance or objection in the bidding documents or the Contract Documents) of any such Subcontractor, Supplier or other person or organization so identified may be revoked on the basis of reasonable objection after due investigation, in which case CONTRACTOR shall submit an acceptable substitute. If after bid opening and prior to the award of the contract, the CITY objects to certain suppliers or subcontractors, the CITY may permit CONTRACTOR to submit an acceptable substitute so long as there is no change in the contract price or contract time. If the contract price or contract time is increased, the CITY may return the bid bond and award the contract to the next qualified, competent bidder. If after the award of the contract, the CITY objects to certain suppliers or subcontractors, the CITY shall permit CONTRACTOR to make an appropriate and acceptable substitution which is also acceptable to the CITY. No acceptance by the CITY or the ENGINEER of any such Subcontractor.

supplier or other person or organization shall constitute a waiver of any right of the CITY or ENGINEER to reject defective Work.

6.9. CONTRACTOR shall be fully responsible to the CITY and ENGINEER for all acts and omissions of the Subcontractors, Suppliers and other persons and organizations performing or furnishing any of the Work under a direct or indirect contract with CONTRACTOR just as CONTRACTOR is responsible for CONTRACTOR'S own acts and omissions. Nothing in the Contract Documents shall create any contractual relationship between the CITY or the ENGINEER and any such Subcontractor, Supplier or other person or organization, nor shall it create any obligation on the part of the CITY or ENGINEER to pay or to see to the payment of any moneys due any such Subcontractor, Supplier or other person or organization except as may otherwise be required by Laws and Regulations.

6.10. The divisions and sections of the Technical Specifications and the identifications of any Drawings shall not control CONTRACTOR in dividing the Work among Subcontractors or Suppliers or delineating the Work to be performed by any specific trade.

6.11. All Work performed for CONTRACTOR by a Subcontractor will be pursuant to an appropriate agreement between CONTRACTOR and the Subcontractor which specifically binds the Subcontractor to the applicable terms and conditions of the Contract Documents for the benefit of the CITY and the ENGINEER.

PATENT FEES AND ROYALTIES:

6.12. CONTRACTOR shall pay all license fees and royalties and assume all costs incident to the use in the performance of Work or the incorporation in the Work of any invention, design, process, product or device which is the subject of patent rights or copyrights held by others. If a particular invention, design, process, product or device is specified in the Contract Documents for use in the performance of the Work and if to the actual knowledge of the CITY or ENGINEER its use is subject to patent rights or copyrights calling for the payment of any license fee or royalty to other, the existence of such rights shall be disclosed by the CITY in the Contract Documents.

CONTRACTOR shall indemnify, defend and hold harmless the CITY and anyone directly or indirectly employed by the CITY from and against all claims, damages, losses and expenses (including attorney's fees and court costs) arising out of any claims of an infringement of patent rights, copyrights, trade marks trade secrets or proprietary information incident to the use in the performance of the Work or resulting from the incorporation in the Work of any invention, design, process, product or device not specified in the Contract Documents, and shall defend all such claims in connection with any alleged infringement of such rights. This indemnification provision shall survive the termination of this agreement.

PERMITS:

6.13. CONTRACTOR shall obtain and pay for all construction permits and licenses. The CITY shall assist CONTRACTOR, when necessary, in obtaining such permits and licenses. CONTRACTOR shall pay all governmental charges and inspection fees necessary for prosecution of the Work, which are applicable at the time of opening of Bids. There will be no cost for permits issued by the CITY. CONTRACTOR shall pay all charges of utility for connections to the Work, and the CITY shall pay all charges of such utility owners for capital costs related thereto such as plant investment fees.

LAWS AND REGULATIONS:

6.14.1. CONTRACTOR shall give all notices and comply with all laws, ordinances, rules and regulations applicable to furnishing and performance of the Work. Except where otherwise expressly required by applicable laws, ordinances, rules and regulations, neither the CITY nor the ENGINEER shall be responsible for monitoring CONTRACTOR'S compliance with any Laws, ordinances, rules or regulations.

6.14.2. If CONTRACTOR observes that the Specifications or Drawings are at variance with any laws, ordinances, rules or regulations, CONTRACTOR shall give CITY and ENGINEER prompt, written notice thereof, and any necessary changes will be authorized by one of the methods indicated in Paragraph 3.4. If CONTRACTOR performs

any Work knowing or having reason to know that it is contrary to such laws, ordinances, rules or regulations, and without such notice to the CITY and ENGINEER, CONTRACTOR shall bear all costs arising therefrom; however, it shall not be CONTRACTOR'S primary responsibility to make certain that the Specifications and Drawings are in accordance with such laws, ordinances, rules and regulations.

TAXES:

6.15. CONTRACTOR shall pay all sales, consumer, use and other similar taxes required to be paid by CONTRACTOR in accordance with the laws, ordinances and regulations of the place of the Project which are applicable during the performance of the Work.

USE OF PREMISES:

6.16. CONTRACTOR shall confine construction equipment, the storage of materials and equipment and the operations of workers to the project site and land and areas identified in and permitted by the Contract Documents and other land and areas permitted by laws, ordinances, and regulations, rights-of-way, permits and easements, and shall not reasonably encumber the premises with construction equipment or other materials or equipment. CONTRACTOR shall assume full responsibility for any damage to any such land or area, or to the owner or occupant thereof or of any land or areas contiguous thereto, resulting from the performance of the Work. Should any claim be made against the CITY or ENGINEER by any such owner or occupant because of the performance of the Work, CONTRACTOR shall promptly attempt to settle with such other party by agreement or otherwise resolve the claim. CONTRACTOR shall, to the fullest extent permitted by laws and regulations, indemnify, defend and hold the CITY and ENGINEER harmless from and against all claims, damages, losses and expenses (including, but not limited to, fees of engineers, architects, attorneys and other professionals and court costs) arising directly, indirectly or consequentially out of any action, legal or equitable, brought by any such other party against the CITY or ENGINEER to the extent based on a claim arising out of CONTRACTOR'S performance of the Work. This

indemnification provision shall survive the termination of this agreement.

6.17. During the progress of the Work, CONTRACTOR shall keep the premises free from accumulations of waste materials, rubbish and other debris resulting from the Work. At the completion of the Work CONTRACTOR shall remove all waste materials, rubbish and debris from and about the premises as well as all tools, appliances, construction equipment and machinery, and surplus materials, and shall leave the site clean and ready for occupancy by the CITY. CONTRACTOR shall restore to original condition all property not designated for alteration by the Contract Documents.

6.18. CONTRACTOR shall not load nor permit any part of any structure to be loaded in any manner that will endanger the structure, nor shall CONTRACTOR subject any part of the Work or adjacent property to stresses or pressures that will endanger it.

RECORD DOCUMENTS:

6.19. CONTRACTOR shall maintain in accordance with the Technical Specifications in a safe place at the site one record copy of all Drawings, Specifications, Addenda, Written Amendments, Change Orders, Work Directive Changes, Field Orders, and written interpretations and clarifications (issued pursuant to paragraph 9.4) in good order and annotated to show all changes made during construction. The record documents together with all approved samples and a counterpart of all approved Shop Drawings will be available to the ENGINEER for reference. Upon completion of the Work, these record documents, samples, and Shop Drawings will be delivered to ENGINEER for the CITY.

SAFETY AND PROTECTION:

6.20. CONTRACTOR shall be responsible for initiating, maintaining and supervising all safety precautions and programs in connection with the Work. CONTRACTOR shall take all necessary precautions for the safety of, and shall provide the necessary protection to prevent damage, injury or loss to:

6.20.1. all employees on the Work and other persons and organizations who may be affected thereby;

6.20.2. all the Work and materials and equipment to be incorporated therein, whether in storage on or off the site; and

6.20.3. other property at the site or adjacent thereto, including trees, shrubs, lawns, walks, pavements, roadways, structures, utilities and Underground Facilities not designated for removal, relocation or replacement in the course of construction. CONTRACTOR shall comply with all applicable laws, ordinances, rules and regulations of any public body having jurisdiction for the safety of persons or property or to protect them from damage, injury or loss on or off the Work and shall erect and maintain all necessary safeguards for such safety and protection. CONTRACTOR shall notify owners of adjacent property and of Underground Facilities and utility owners when prosecution of the Work may affect them, and shall cooperate with them in the protection, removal, relocation and replacement of their property. All damage, injury or loss to any property referred to in paragraph 6.20.2 or 6.20.3 caused, directly or indirectly, in whole or in part, by CONTRACTOR, any Subcontractor, Supplier or any other person or organization directly or indirectly employed by any of them to perform or furnish any of the Work for anyone for whose acts any of them may be liable, shall be remedied by CONTRACTOR (except damage or loss attributable to the fault of Drawings or Specifications or to the acts or omissions of the CITY or the ENGINEER or anyone employed by either of them or anyone for whose acts either of them may be liable, and not attributable, directly or indirectly, in whole or in part, to the fault or negligence of CONTRACTOR). CONTRACTOR'S duties and responsibilities for the safety and protection of the Work shall continue until such time as all the Work is completed and ENGINEER has issued a notice to the CITY and CONTRACTOR in accordance with paragraph 14.13 that the Work is acceptable

(except as otherwise expressly provided in connection with Substantial Completion).

The safety provisions of applicable laws and building and construction codes shall be observed and the Contractor shall take or cause to be taken such additional safety and health measures as the Local Public Agency involved may determine to be reasonably necessary. Machinery, equipment and all hazards shall be guarded in accordance with the safety provisions of the "Manual of Accident Prevention in Construction" as published by the Associated General Contractors of America, Inc., to the extent that such provisions are not in conflict with applicable laws.

The Contractor shall maintain an accurate record of all cases of death, occupational disease, or injury requiring medical attention or causing loss of time from work, arising out of an and in the course of employment on Work under the Contract. The Contractor shall promptly furnish the Local Public Agency with reports concerning these matters.

6.21. CONTRACTOR shall designate a responsible representative at the site whose duty shall be the prevention of accidents. This person shall be CONTRACTOR'S superintendent unless otherwise designated in writing by CONTRACTOR to the CITY.

EMERGENCIES AND PRECAUTIONS DURING ADVERSE WEATHER:

6.22.1. In emergencies affecting the safety or protection of persons or the Work or property at the site or adjacent thereto. CONTRACTOR, without special instruction or authorization from ENGINEER or the CITY, is obligated to act to prevent threatened damage, injury or loss. CONTRACTOR shall give ENGINEER prompt written notice if CONTRACTOR believes that any significant changes in the Work or variations from the Contract Documents have been caused thereby. If ENGINEER determines that a change in the Contract Documents is required because of the action taken in response to an emergency, a Work Directive Change Order or Change

Order will be issued to document the consequences of the changes or variations.

6.22.2. During adverse weather, and against the possibility thereof, the CONTRACTOR shall take all necessary precautions to ensure that the Work shall be done in a good and workmanlike condition and is satisfactory in all respects. When required, protection shall be provided by the use of tarpaulins, wood and building paper shelters, or other acceptable means. The CONTRACTOR shall be responsible for all changes caused by adverse weather, including unusually high winds and water levels and he shall take such precautions and procure such additional insurance as he deems prudent. The ENGINEER may suspend construction operations at any time when, in his judgment, the conditions are unsuitable or the proper precautions are not being taken, whatever the weather or water level conditions may be, in any season.

SHOP DRAWINGS AND SAMPLES:

6.23. After checking and verifying all field measurements and after complying with applicable procedures specified in the General Requirements, CONTRACTOR shall submit to ENGINEER for review in accordance with the accepted schedule of Shop Drawing submissions (see paragraph 2.9), ordinances, rules and all Shop Drawings which will bear the stamp that CONTRACTOR has satisfied CONTRACTOR'S responsibilities under the Contract Documents with respect to the review of the submission. All submissions will be identified as ENGINEER may require. The data shown on the Shop Drawings will be complete with respect to quantities, dimensions, specified performance and design criteria, materials and similar data to enable ENGINEER to review the information as required.

6.24. CONTRACTOR shall also submit to ENGINEER for review and approval with such promptness as to cause no delay in Work, all samples required by the Contract Documents. All samples will have been checked by and accompanied by a specific written indication that CONTRACTOR has satisfied CONTRACTOR'S responsibilities under the Contract Documents with respect to the review of the submission and will be identified clearly as to

material, Supplier, pertinent data such as catalog numbers and the use for which intended.

6.25.1. Before submission of each Shop Drawing or sample CONTRACTOR shall have determined and verified all quantities, dimensions, specified performance criteria, installation requirements, materials, catalog numbers and similar data with respect thereto and reviewed or coordinated each Shop Drawing or sample with other Shop Drawings and samples and with the requirements of the Work and the Contract Documents.

6.25.2. At the time of each submission, CONTRACTOR shall give ENGINEER specific written notice of each variation that the Shop Drawings or samples may have from the requirements of the Contract Documents, and, in addition shall cause a specific notation to be made on each Shop Drawing submitted to ENGINEER for review of each such variation.

6.26. ENGINEER will review within ten days of receipt thereof, Shop Drawings and samples but ENGINEER'S review will be only for conformance with the design concept of the Project and for compliance with the information given in the Contract Documents and shall not extend to means, methods, techniques, sequences or procedures of construction (except where a specific means, method, technique, sequence or procedure of construction is indicated in or required by the Contract Documents) or to safety precautions or programs incident thereto. The review of a separate item as such will not indicate review of the assembly in which the item functions. CONTRACTOR shall make corrections required by ENGINEER, and shall return the required number of corrected copies of Shop Drawings and submit as required new samples for review. CONTRACTOR shall direct specific attention in writing to revisions other than the corrections called for by ENGINEER on previous submittals. ENGINEER will review one (1) resubmittal for each shop drawing or product data. All costs of reviewing additional submittals shall be at the CONTRACTOR'S expense.

6.27. ENGINEER'S review of Shop Drawings or samples shall not relieve CONTRACTOR from responsibility for any variation

from the requirements of the Contract Documents unless CONTRACTOR has in writing called ENGINEER'S attention to each such variation at the time of submission as required by paragraph 6.25.2 and ENGINEER has given written approval of each such variation by a specific written notation thereof incorporated in or accompanying the Shop Drawing or sample approval; nor will any review by ENGINEER relieve CONTRACTOR from responsibility for errors or omissions in the Shop Drawings or from responsibility for having complied with the provisions of paragraph 6.25.1.

6.28. Where a Shop Drawing or sample is required by the Specifications, any related Work performed prior to ENGINEER'S review and acceptance of the pertinent submission will be the sole expense and responsibility of CONTRACTOR.

CONTINUING THE WORK:

6.29. CONTRACTOR shall carry on the Work and adhere to the progress schedule during all disputes or disagreements with the CITY. No Work shall be delayed or postponed pending resolution of any disputes or disagreements, except as permitted by paragraph 15.5 or as CONTRACTOR and the CITY may otherwise agree in writing.

INDEMNIFICATION:

6.30. The parties recognize that the Contractor is an independent contractor. The Contractor agrees to assume liability for and indemnify, hold harmless, and defend the City, its commissioners, mayor, officers, employees, agents, and attorneys of, from, and against all liability and expense, including reasonable attorney's fees, in connection with any and all claims, demands, damages, actions, causes of action, and suits in equity of whatever kind or nature, including claims for personal injury, property damage, equitable relief, or loss of use, to the extent caused by the negligence, recklessness, or intentionally wrongful conduct of the Contractor, its agents, officers, contractors, subcontractors, employees, or anyone else utilized by the Contractor in the performance of this Agreement. The Contractor's liability hereunder shall include all attorney's fees and costs incurred by the City in the enforcement of this indemnification provision. This includes claims made by the employees of the Contractor against

the City and the Contractor hereby waives its entitlement, if any, to immunity under Section 440.11, Florida Statutes. Such obligations contained in this provision shall survive termination of this Agreement and shall not be limited by the amount of any insurance required to be obtained or maintained under this Agreement. Nothing contained in the foregoing indemnification shall be construed as a waiver of any immunity or limitation of liability the City may have under the doctrine of sovereign immunity or Section 768.28, Florida Statutes.

ARTICLE 7 - OTHER WORK

RELATED WORK AT SITE:

7.1. The CITY may perform other work related to the Project at the site by the CITY'S own forces, let other direct contracts therefor which shall contain General Conditions similar to these. If the fact that such other work is to be performed was not noted in the Contract Documents, written notice thereof will be given to CONTRACTOR prior to starting any such other work; and, if CONTRACTOR believes that such performance will involve additional time and the parties are unable to agree as to the extent thereof, CONTRACTOR may make a claim therefor as provided in Articles 11 and 12. If the performance of additional Work by other Contractor or the CITY is noted in the Contract Documents, no additional adjustment of time or compensation shall be considered.

7.2. CONTRACTOR shall afford each Utility owner and other contractors who are a party to such a direct contract (or the CITY, if the CITY is performing the additional work with the CITY'S employees) proper and safe access to the site and a reasonable opportunity for the introduction and storage of materials and equipment and the execution of such work, and shall properly connect and coordinate the work with theirs. CONTRACTOR shall do all cutting, fitting and patching of the Work that may be required to make its several parts come together properly and integrate with such other work. CONTRACTOR shall not endanger any work of others by cutting, excavating or otherwise altering their work and will only cut or alter their work with the written consent of the CITY and ENGINEER and the others whose work will be affected. The duties and responsibilities of CONTRACTOR under this paragraph are for the benefit of the CITY and other contractors to the extent that there are comparable provisions for the benefit of CONTRACTOR in said direct contracts between the CITY and other contractors.

7.3. If any part of CONTRACTOR'S Work depends for proper execution or results upon the work

of any such other contractor (or the CITY), CONTRACTOR shall inspect and promptly report to ENGINEER in writing any delays, defects or deficiencies in such other work that render it unavailable or unsuitable for such proper execution and results of CONTRACTOR'S work. CONTRACTOR'S failure to report will constitute an acceptance of the other work as fit and proper for integration with CONTRACTOR'S Work except for latent defects and deficiencies in the other work.

COORDINATION:

7.4. If the CITY contracts with others for the performance of other work on the Project at the site, the person or organization who will have authority and responsibility for coordination of the activities among the various prime contractors will be identified in the Technical Specifications and the specific matters to be covered by such authority and responsibility will be itemized, and the extent of such authority and responsibilities will be provided in the Technical Specifications. Unless otherwise provided in the Technical Specifications, neither the CITY nor the ENGINEER shall have any authority or responsibility in respect of such coordination.

ARTICLE 8 - THE CITY'S RESPONSIBILITIES

8.1. The CITY shall issue all communications to CONTRACTOR through ENGINEER.

8.2. In case of termination of the employment of ENGINEER, the CITY shall appoint a consultant whose status under the Contract Documents shall be that of the former ENGINEER.

8.3. The CITY shall furnish the data required of the CITY under the Contract Documents promptly and shall make payments to CONTRACTOR promptly after they are due as provided in paragraphs 14.4 and 14.13.

8.4. The CITY'S duties in respect of providing lands and easements and providing engineering surveys to establish reference points are set forth in paragraphs 4.1 and 4.4. Paragraphs 4.2.1 and 4.2.2 refer to the CITY'S identifying and making

available to CONTRACTOR copies of all reports of explorations and tests of subsurface conditions at the site and in existing structures which have been utilized by ENGINEER in preparing the Drawings and Specifications.

8.5. The CITY is obligated to execute Change Orders as indicated in paragraph 10.4.

8.6. In connection with the CITY'S right to stop Work or suspend Work, see paragraph 13.10 and 15.1. Paragraph 15.2 deals with the CITY'S right to terminate services of CONTRACTOR.

ARTICLE 9 - ENGINEER'S STATUS DURING CONSTRUCTION

CITY'S REPRESENTATIVE:

9.1. The ENGINEER will be the CITY'S representative during the construction period. The duties and responsibilities and the limitations of authority of ENGINEER and the CITY'S representative during construction are set forth in the Contract Documents and shall not be extended without written consent of the CITY and ENGINEER.

VISITS TO SITE:

9.2. After written notice to proceed with the work, the ENGINEER shall make visits to the site at intervals appropriate to the various stages of construction to observe the progress and quality of the executed Work and to determine, in general, if the Work is proceeding in accordance with the Contract Documents; he will not be responsible for the construction means, methods, procedures, techniques and sequences of construction and he will not be responsible for the CONTRACTOR'S failure to perform the construction Work in accordance with the Contract Documents; he will not be responsible for safety precautions and procedures in connection with the Work; and during such visits and on the basis of his on-site observations, as an experienced and qualified design professional, he will keep the CITY informed of the progress of the work. will endeavor to guard the CITY against defects and deficiencies in the

Work of the Contractor and may reject Work as failing to conform to the Contract Documents.

PROJECT REPRESENTATION:

9.3. A Resident Project Representative may be assigned to assist ENGINEER in carrying out his responsibilities to CITY at the site. Resident Project Representative is ENGINEER'S agent at site, will act as directed by and under the supervision of ENGINEER, and will confer with ENGINEER regarding Resident Representative's actions. Resident Project Representative's dealing in matters pertaining to the on-site work shall in general be with ENGINEER and CONTRACTOR keeping the CITY advised as necessary. Resident Project Representative's dealings with subcontractors shall only be through or with the full knowledge and approval of CONTRACTOR. Resident Project Representative shall generally communicate with the City with the knowledge of and under the direction of ENGINEER.

9.3.1. Resident Project Representative shall where applicable:

9.3.1.1. Review the progress schedule, schedule of Shop Drawing submittals and schedule of values prepared by CONTRACTOR and consult with ENGINEER concerning its general acceptability.

9.3.1.2. Attend meetings with CONTRACTOR, such as pre-construction conferences, progress meetings, job conferences and other project-related meetings, and prepare and circulate copies of minutes thereof.

9.3.1.3. Working principally through CONTRACTOR'S superintendent, assist ENGINEER in serving as the CITY'S liaison with CONTRACTOR, when CONTRACTOR'S operations affect the CITY'S on-site operations.

9.3.1.4. Assist in obtaining from the CITY additional details or information, when required for proper execution of the Work.

9.3.1.5. Record date of receipt of Shop Drawings and samples.

9.3.1.6. Receive samples which are furnished at the site by CONTRACTOR, and notify the ENGINEER of availability of samples for examination.

9.3.1.7. Advise the ENGINEER and CONTRACTOR of the commencement of any Work requiring a Shop Drawing if the submittal has not been approved by the ENGINEER.

9.3.1.8. Conduct on-site observations of the Work in progress to assist the ENGINEER in determining if the Work is, in general, proceeding in accordance with the Contract Documents.

9.3.1.9. Report to the ENGINEER whenever Residential Project Representative believes that any Work is unsatisfactory, faulty or defective or does not conform to the Contract Documents, or has been damaged, or does not meet the requirements of any inspection, test or approval required to be made; and advise the ENGINEER of Work that Resident Project Representative believes should be uncovered for observation, or requires special testing, inspection or approval. Nothing herein shall relieve the CONTRACTOR or the ENGINEER from the duties imposed by contract.

9.3.1.10. Verify that tests, equipment and systems startups, and operating and maintenance training are conducted in the presence of appropriate personnel, and that CONTRACTOR maintains adequate records thereof; and observe, record and report to the ENGINEER appropriate details relative to the test procedures and startups

9.3.1.11. Accompany visiting inspectors representing public or other agencies having jurisdiction over the Project, record the results of these inspections and report to the ENGINEER.

9.3.1.12. Report to ENGINEER when clarifications and interpretations of the Contract Documents are needed and transmit to CONTRACTOR clarifications and interpretations as issued by the ENGINEER.

9.3.1.13. Consider and evaluate CONTRACTOR'S suggestions for modifications in Drawings or Specifications and report with Resident Project Representative's recommendations to the ENGINEER. Transmit to CONTRACTOR decisions as issued by the ENGINEER.

9.3.1.14. Maintain at the job site orderly files for correspondence, reports of job conferences, Shop Drawings and samples, reproductions of original Contract Documents including all Work Directive Changes, Addenda, Change Orders, Field Orders, additional Drawings issued subsequent to the execution of the Contract, ENGINEER'S clarifications and interpretations of the Contract Documents, progress reports, and other Project related documents.

9.3.1.15. Keep a diary or log book, recording CONTRACTOR hours on the job site, weather conditions, data relative to questions of Work Directive Changes, Change Orders or changed conditions, list of job site visitors, daily activities, decisions, observations in general, and specific observations in more detail as in the case of observing test procedures; and send copies to the ENGINEER.

9.3.1.16. Record all names, addresses and telephone numbers of the CONTRACTOR, all subcontractors and major suppliers of material and equipment.

9.3.1.17. Furnish the ENGINEER periodic reports as required of progress of the Work of the CONTRACTOR'S compliance with the progress schedule and schedule of Shop Drawing and sample submittals.

9.3.1.18. Consult with the ENGINEER in advance of schedule major tests, inspections or start of important phases of the Work.

9.3.1.19. Draft proposed Change Orders and Work Directive Changes, obtaining backup material from CONTRACTOR and recommend to the ENGINEER, Change Orders, Work Directive Changes, and Field Orders.

9.3.1.20. Report immediately to the ENGINEER and the CITY upon the occurrence of any accident.

9.3.1.21. Review applications for payment with CONTRACTOR for compliance with the established procedure for their submission and forward with recommendations to the ENGINEER, noting particularly the relationship of the payment requested to the schedule of values, Work completed and materials and equipment delivered at the site but not incorporated in the Work.

9.3.1.22. During the course of the work, verify that certificates, maintenance and operation manuals and other data required to be assembled and furnished by CONTRACTOR are applicable to the items actually installed and in accordance with the Contract Documents, and have this material delivered

to the ENGINEER for review and forwarding to CITY prior to final payment for the Work.

9.3.1.23. Before the ENGINEER issues a Certificate of Substantial Completion, submit to CONTRACTOR a list of observed items requiring completion or correction.

9.3.1.24. Conduct final inspection in the company of the ENGINEER, the CITY and the CONTRACTOR and prepare a final list of items to be completed or corrected.

9.3.1.25. Observe that all items on final list have been completed or corrected and make recommendations to the ENGINEER concerning acceptance.

9.3.2. The Resident Project Representative shall not:

9.3.2.1. Authorize any deviation from the Contract Documents or substitution of materials or equipment.

9.3.2.2. Exceed limitations of the ENGINEER'S authority as set forth in the Contract Documents.

9.3.2.3. Undertake any of the responsibilities of CONTRACTOR, subcontractors, or CONTRACTOR'S superintendent.

9.3.2.4. Advise on, issue directions relative to or assume control over any aspect of the means, methods, techniques, sequences or procedures of construction unless such advice or directions are specifically required by the Contract Documents.

9.3.2.5. Advise on, issue directions regarding or assume control

over safety precautions and programs in connection with the Work.

9.3.2.6. Accept Shop Drawing or sample submittals from anyone other than CONTRACTOR.

9.3.2.7. Authorize the City to occupy the Project in whole or in part.

9.3.2.8. Participate in specialized field or laboratory tests or inspections conducted by others except as specifically authorized by the ENGINEER.

CLARIFICATIONS AND INTERPRETATIONS:

9.4. The ENGINEER will issue with reasonable promptness such written clarifications or interpretations of the requirements of the Contract Documents (in the form of Drawings or otherwise) as the ENGINEER may determine necessary, which shall be consistent with or reasonably inferable from the overall intent of the Contract Documents. If CONTRACTOR believes that a written clarification of interpretation justifies an increase in the Contract Price or an extension of the Contract Time and the parties are unable to agree to the amount or extent thereof, CONTRACTOR may make a claim therefor as provided in Article 11 or Article 12.

AUTHORIZED VARIATIONS OF WORK:

9.5. ENGINEER may authorize minor variations in the Work from the requirements of the Contract Documents which do not involve an adjustment in the Contract Price or the Contract Time and are consistent with the overall intent of the Contract Documents. These may be accomplished by a field Order and will be binding on the CITY, and also on CONTRACTOR who shall perform the Work involved promptly. If CONTRACTOR believes that a Field Order justifies an increase in the Contract Price or an extension of the Contract Time and the parties are unable to agree as to the amount or extent thereof, CONTRACTOR may make a claim therefor as provided in Article 11 and 12. The ENGINEER is not authorized to waive any requirements of this contract or to agree to any increase in the contract price or contract time.

REJECTING DEFECTIVE WORK:

9.6. The ENGINEER will have authority to disapprove or reject Work which ENGINEER believes to be defective or believes to be in nonconformance with the intent of the contract documents, and will also have authority to require special inspection or testing of the Work as provided in paragraph 13.9, whether or not the Work is fabricated, installed or completed.

SHOP DRAWINGS, CHANGE ORDERS AND PAYMENTS:

9.7. In connection with ENGINEER'S responsibility for Shop Drawings and samples, see paragraphs 6.23 through 6.28 inclusive.

9.8. In connection with ENGINEER'S responsibilities as to Change Orders, see Article 10, 11, and 12.

9.9. In connection with ENGINEER'S responsibilities in respect of Applications for Payment, etc., see Article 14.

DETERMINATIONS FOR UNIT PRICES:

9.10. ENGINEER will determine the actual quantities and classifications of Unit Price Work performed by CONTRACTOR. ENGINEER will review with CONTRACTOR ENGINEER'S preliminary determinations on such matters before rendering a written decision thereon (by recommendation of an Application for Payment or otherwise). ENGINEER'S written decisions thereon will be final and binding upon the CITY or CONTRACTOR unless, within ten days after the date of any such decision, either the CITY or CONTRACTOR delivers to the other party to the Agreement and to ENGINEER written notice of intention to appeal from such a decision.

DECISIONS ON DISPUTES:

9.11. The ENGINEER will be the initial interpreter of the requirements of the Contract Documents and judge of the acceptability of the Work thereunder. Claims, disputes and other matters relating to the acceptability of the Work or the interpretation of the requirements of the Contract Documents pertaining to the performance and

furnishing of the Work and claims under Article 11 and 12 in respect of changes in the Contract Price or Contract Time will be referred initially to ENGINEER in writing with a request for a formal decision in accordance with this paragraph, which ENGINEER will render in writing within a reasonable time. Written notice of each such claim, dispute and other matter will be delivered by the claimant to ENGINEER and the other party to the Agreement promptly (but in no event later than ten (10) days) after the occurrence of the event giving rise thereto, and written supporting data will be submitted to ENGINEER and the other party within thirty (30) days after such occurrence unless ENGINEER allows an additional period of time to ascertain more accurate data in support of the claim.

9.12. When functioning as interpreter and judge under paragraphs 9.10 and 9.11, ENGINEER will not show partiality to the CITY or CONTRACTOR. The rendering of a decision by ENGINEER pursuant to paragraphs 9.10 and 9.11 with respect to any such claim, dispute or other matter will be a condition precedent to any exercise by the CITY or the CONTRACTOR of such rights or remedies as either may otherwise have under the Contract Documents or by Laws or Regulations in respect of any such claim, dispute or other matter.

LIMITATIONS ON ENGINEER'S RESPONSIBILITIES:

9.13. Neither ENGINEER'S authority to act under this Article 9 or elsewhere in the Contract Documents nor any decision made by ENGINEER either to exercise or not exercise such authority shall give rise to any duty or responsibility of ENGINEER or CONTRACTOR, any Subcontractor, any Supplier, or any other person or organization performing any of the Work, or to any surety for any of them.

9.14. Whenever in the Contract Documents the term "as ordered", "as directed", "as required", "as allowed", "as approved" or terms of like effect or import are used, or the adjectives "reasonable", "suitable", "acceptable", "proper", or "satisfactory" or adjectives of the like effect or import are used to describe a requirement, direction, review or judgment of ENGINEER as to the Work, it is intended that such requirement, direction, review or judgment will be solely to evaluate the Work for compliance with the Contract Documents (unless there is a specific

statement indicating otherwise). The use of any such term or adjective shall not be effective to assign to ENGINEER any duty or authority to supervise or direct the furnishing or performance of the Work or any duty or authority to undertake responsibility contrary to the provisions of paragraph 9.15 or 9.16.

9.15. ENGINEER will not be responsible for CONTRACTOR'S means, methods, techniques, sequences or procedures of construction, or the safety precautions and programs incident thereto, and ENGINEER will not be responsible to CONTRACTOR for CONTRACTOR'S failure to perform or furnish the Work in accordance with the Contract Documents.

9.16. ENGINEER will not be responsible for the acts or omissions of CONTRACTOR or of any Subcontractor, any Supplier, or of any other person or organization performing or furnishing any of the Work.

ARTICLE 10 - CHANGES IN THE WORK

10.1. Without invalidating the Agreement and without notice to any surety, the CITY may, at any time or from time to time, order additions, deletions or revisions in the Work; these will be authorized by a Written Amendment, a Change Order, or a Work Directive Change. Upon receipt of any such document, CONTRACTOR shall promptly proceed with the Work involved which will be performed under the applicable conditions of the Contract Documents (except as otherwise specifically provided).

10.2. If the CITY and CONTRACTOR are unable to agree as to the extent, if any, of an increase or decrease in the Contract Price or an extension or shortening of the Contract Time that should be allowed as a result of a Work Directive Change, a claim may be made therefore as provided in Article 11 or Article 12.

10.3. CONTRACTOR shall not be entitled to an increase in the Contract Price or an extension of the Contract Time with respect to any Work performed that is not required by the Contract Documents as amended, modified and supplemented as provided in paragraphs 3.4 and 3.5, except in the

case of an emergency as provided in paragraph 6.22.1 and except in the case of uncovering Work as provided in paragraph 13.9.

10.4. The CITY and CONTRACTOR shall execute appropriate Change Orders (or Written Amendments) covering:

10.4.1. Changes in the work which are ordered by the CITY pursuant to paragraph 10.1, are required because of acceptance of defective Work under paragraph 13.13 or correcting defective Work under paragraph 13.14, or are agreed to by the parties.

10.4.2. Changes in the Contract Price or Contract Time which are agreed to by the parties;

10.4.3. Changes in the Contract Price or Contract Time which embody the substance of any written decision rendered by ENGINEER pursuant to paragraph 9.11; provided that, in lieu of executing any such Change Order, an appeal may be taken from any such decision in accordance with the provision of the Contract Documents and applicable Laws and Regulations, but during any such appeal, CONTRACTOR shall carry on the Work and adhere to the progress schedule as provided in paragraph 6.29.

10.5. It is distinctly agreed and understood that any changes made in the Contract Documents for this Work (whether such changes increase or decrease the amount thereof) or any change in the manner or time of payments or time of performance made by the CITY to the CONTRACTOR shall in no way annul, release or affect the liability and surety on the Bonds given by the CONTRACTOR. If notice of any change affecting the general scope of the Work or the provisions of the Contract Documents (including, but not limited to, Contract Price or Contract Time) is required by the provisions of any bond to be given to a surety, the giving of any such notice will be CONTRACTOR'S responsibility, and the amount of each applicable Bond will be adjusted accordingly.

10.6. Notwithstanding, anything to the contrary contained within the contract documents, all change orders involving additional cost or extensions

of time, shall be governed by the ordinances of the City of Fernandina Beach.

ARTICLE II - CHANGE OF CONTRACT PRICE

11.1. The Contract Price constitutes the total compensation (subject to authorized adjustments) payable to CONTRACTOR for performing the Work. All duties, responsibilities and obligations assigned to or undertaken by CONTRACTOR shall be at his expense without change in the Contract Price.

11.2. The Contract Price may only be changed by a Change Order or by a Written Amendment. Any claim for an increase or decrease in the Contract Price shall be based on written notice delivered by the party making the claim to the other party and to ENGINEER promptly (but in no event later than ten (10) days) after the occurrence of the event giving rise to the claim and stating the general nature of the claim. Notice of the amount of the claim with supporting data shall be delivered within thirty (30) days after such occurrence (unless ENGINEER allows an additional period of time to ascertain more accurate data in support of the claim) and shall be accompanied by claimant's written statement that the amount claimed covers all known amounts (direct, indirect and consequential) to which the claimant is entitled as a result of the occurrence of said event. All claims for adjustment in the Contract Price shall be determined by ENGINEER in accordance with paragraph 9.11 if the CITY and CONTRACTOR cannot otherwise agree on the amount involved. No claim for an adjustment in the Contract Price will be valid if not submitted in accordance with this paragraph 11.2.

11.3. The value of any Work covered by a Change Order or of any claim for an increase or decrease in the Contract Price shall be determined in one of the following ways:

11.3.1. Where the Work involved is covered by unit prices contained in the Contract Documents, by application of unit prices to the quantities of the items involved

(subject to the provisions of paragraphs 11.9.1. through 11.9.3. inclusive).

11.3.2. By mutual acceptance of a lump sum (which shall include an allowance for overhead and profit in accordance with paragraph 11.6.2.1).

11.3.3. On the basis of the Cost of the Work (determined as provided in paragraphs 11.4 and 11.5) plus a CONTRACTOR'S Fee for overhead and profit (determined as provided in paragraphs 11.6 and 11.7).

COST OF THE WORK:

11.4. The term Cost of the Work means the sum of all costs necessary incurred and paid by CONTRACTOR in the proper performance of the Work. Except as otherwise may be agreed to in writing by the CITY, such costs shall be in amounts no higher than those prevailing in the locality of the Project, shall include only the following items and shall not include any of the costs itemized in paragraph 11.5:

11.4.1. Payroll costs for employees in the direct employ of CONTRACTOR in the performance of the Work under schedules of job classification agreed upon by the CITY and CONTRACTOR. Payroll costs for employees not employed full time on the Work shall be apportioned on the basis of their time spent on the Work. Payroll costs shall include, but not be limited to, salaries and wages plus the cost of fringe benefits which shall include social security contributions, unemployment, excise and payroll taxes, workers' or workmen's compensation, health and retirement benefits, sick leave, vacation and holiday pay applicable thereto. Such employees shall include superintendents and foremen at the site. The expenses of performing Work after regular working hours, on Saturday, Sunday or legal holidays, shall be included in the above to the extent authorized by the CITY.

11.4.2. Cost of all materials and equipment furnished and incorporated in the Work, including costs of transportation and storage thereof, and Suppliers' field services

required in connection therewith. All cash discounts shall accrue to CONTRACTOR unless the CITY deposits funds with CONTRACTOR with which to make payments, in which case the cash discounts shall accrue to the CITY. All trade discounts, rebates and refunds and all returns from sale of surplus materials and equipment shall accrue to the CITY, and CONTRACTOR shall make provisions so that they may be obtained.

11.4.3. Payments made by CONTRACTOR to the Subcontractors for Work performed by Subcontractors. If required by the CITY, CONTRACTOR shall obtain competitive bids from Subcontractors acceptable to CONTRACTOR and shall deliver such bids to the CITY who will then determine, with the advice of the ENGINEER, which bids will be accepted. If a subcontract provides that the Subcontractor is to be paid on the basis of Cost of the Work Plus a Fee, the Subcontractor's Cost of the Work shall be determined in the same manner as CONTRACTOR'S Cost of Work. All subcontracts shall be subject to the other provisions of the Contract Documents insofar as applicable.

11.4.4. Costs of special consultants (including but not limited to engineers, architects, testing laboratories, surveyors, attorneys and accountants) employed for services specifically related to the Work.

11.4.5. Supplemental costs include the following:

11.4.5.1. Cost, including transportation and maintenance, of all materials, supplies, equipment, machinery, appliances, office and temporary facilities at the site and tools not owned by the workers, which are consumed in the performance of Work, and cost less market value of such items used but not consumed which remain the property of CONTRACTOR.

11.4.5.2. Rentals of all construction equipment and machinery

and the parts thereof whether rented from CONTRACTOR or others in accordance with rental agreements approved by the CITY with the advice of ENGINEER, and the costs of transportation, loading, unloading, installation, dismantling and removal thereof-all in accordance with terms of said rental agreements. The rental of any such equipment, machinery or parts shall cease when the use thereof is no longer necessary for the Work. For special equipment and machinery such as power driven pumps, concrete mixers, trucks, front end loaders, backhoes, and tractors, or other equipment, required for the economical performance of the authorized Work, the CONTRACTOR shall receive payment based on the weekly rate divided by 40 to arrive at an hourly cost. The weekly rate shall be from the latest edition of the Rental Rate blue book for Construction Equipment, published by Equipment Guide Book Co., reduced by 25 percent. Equipment cost shall be calculated based upon the actual time the equipment is used in the Work. If said Work required the use of machinery not on the Work or not to be used on the Work, the cost of transportation, not exceeding a distance of one hundred (100) miles, of such machinery to and from the Work shall be added to the fair rental rate; provided, however, that this shall not apply to machinery or equipment already required to be furnished under the terms of the Contract.

11.4.5.3. Sales, consumer, use or similar taxes related to the work and for which CONTRACTOR is liable, imposed by laws and regulations.

11.4.5.4. Royalty payments and fees for permits and licenses.

11.4.5.5. The site costs of utilities, fuel and sanitary facilities.

11.4.5.6. Cost of premiums for additional bonds and insurance required because of changes in the Work.

11.5. The term Cost of the Work shall not include any of the following:

11.5.1. Payroll costs and other compensation of CONTRACTOR'S officers, executives, principals (of partnership and sole proprietorships), general managers, engineers, architects, estimators, attorneys, auditors, accountants, purchasing and contracting agents, expeditors, timekeepers, clerks and other personnel employed by CONTRACTOR whether at the site or in CONTRACTOR'S principal or a branch office for general administration of the Work and not specifically included in the agreed upon schedule of job classifications referred to in paragraph 11.4.1 or specifically covered by paragraph 11.4.4 -- all of which are to be considered administrative costs covered by the CONTRACTOR'S Fee.

11.5.2. Expenses of CONTRACTOR'S principal and branch offices other than CONTRACTOR'S office at the site.

11.5.3. Any part of CONTRACTOR'S capital expenses, including interest on CONTRACTOR'S capital employed for the Work and charges against CONTRACTOR for delinquent payments.

11.5.4. Cost of premiums for all Bonds and for all Insurance whether or not CONTRACTOR is required by the Contract Documents to purchase and maintain the same (except for the cost of premiums covered by subparagraph 11.4.5.6 above).

11.5.5. Costs due to the negligence or intentional acts of the CONTRACTOR, any Subcontractor, or anyone whose acts any of them may be liable, including but not limited to, the correction of defective Work, disposal of materials or equipment wrongly supplied and making good any damage to property.

11.5.6. Other overhead or general expense costs of any kind and the costs of any item not specifically and expressly included in paragraph 11.4.

CONTRACTOR'S Fee shall be computed on the basis of the net change in accordance with paragraphs 11.6.2.1 through 11.6.2.4, inclusive.

CONTRACTOR'S FEE:

11.6. The CONTRACTOR'S Fee allowed to CONTRACTOR for overhead and profits shall be determined as follows:

11.6.1. A mutually acceptable fixed fee; or if none can be agreed upon,

11.6.2. A fee based on the following percentages of the various portions of the Cost of the Work:

11.6.2.1. The cost allowance for overhead and profit shall not exceed fifteen percent (15%) of the net cost. If the work is done by a Subcontractor, he may add ten percent (10%) of his net cost for overhead and profit and the Contractor may add five percent (5%) of the net cost for overhead and profit. If all the work is done by the Contractor, he may add fifteen percent (15%) of the net cost for overhead and profit;

11.6.2.2. See Article 11.6.2.1;

11.6.2.3. No fee shall be payable on the basis of costs itemized under paragraphs 11.4.4, 11.4.5 and 11.5;

11.6.2.4. The amount of credit to be allowed by CONTRACTOR to the CITY for any such change which results in a net decrease in cost will be the amount of the actual net decrease plus a deduction in CONTRACTOR'S Fee by an amount equal to ten percent of the net decrease; and

11.6.2.5. When both additions and credits are involved in any one change, the adjustment in

11.7. Whenever the cost of any Work is to be determined pursuant to paragraph 11.4 or 11.5, CONTRACTOR will submit in form acceptable to ENGINEER an itemized cost breakdown together with supporting data.

CASH ALLOWANCES:

11.8. It is understood that CONTRACTOR has included in the Contract Price all allowances so named in the Contract Documents and shall cause the Work so covered to be done by such Subcontractors or Suppliers and for such sums within the limit of the allowances as may be acceptable to the ENGINEER, CONTRACTOR agrees that:

11.8.1. The allowances include the cost to CONTRACTOR (less any applicable trade discounts) of materials and equipment required by the allowances to be delivered at the site, and all applicable taxes; and

11.8.2. CONTRACTOR'S costs for unloading and handling on the site, labor, installation costs, overhead, profit and other expenses contemplated for the allowances have been included in the Contract Price and not in the allowances. No demand for additional payment on account of any thereof will be valid.

Prior to final payment, an appropriate Change order will be issued as recommended by ENGINEER to reflect actual amounts due CONTRACTOR on account of Work covered by allowances, and the Contract Price shall be correspondingly adjusted.

UNIT PRICE WORK:

11.9.1. Where the Contract Documents provide that all or part of the Work is to be Unit Price Work, initially the Contract Price will be deemed to include for all Unit Price Work an amount equal to the sum of the established unit prices for each separately identified item of Unit Price Work times the

estimated quantity of each item as indicated in the Agreement. The estimated quantities of items of Unit Price Work are not guaranteed and are solely for the purpose of comparison of Bids and determining an initial Contract Price. Determinations of the actual quantities and classifications of Unit Price Work performed by CONTRACTOR will be made by ENGINEER in accordance with Paragraph 9.10.

11.9.2. Each unit price will be deemed to include an amount considered by CONTRACTOR to be adequate to cover CONTRACTOR'S overhead and profit for each separately identified item.

11.9.3. Where the quantity of any item of Unit Price Work performed by CONTRACTOR differs materially and significantly from the estimated quantity of such item indicated in the Agreement and there is no corresponding adjustment with respect to any other item of Work and if CONTRACTOR believes that CONTRACTOR has incurred additional expense as a result thereof, CONTRACTOR may make a claim for an increase in the Contract Price in accordance with Article 11 if the parties are unable to agree as to the amount of any such increase.

OMITTED WORK:

11.10. The City may at any time, by written order, without Notice to the Sureties, require omission of such contract work as it may find necessary or desirable. An order for omission of work shall be valid only by an executable change order. All work so ordered must be omitted by the CONTRACTOR. The amount by which the contract price shall be reduced shall be determined as follows:

11.10.1. By such applicable unit prices, or rates for work of a similar nature or character as set forth in the contract; or,

11.10.2. By the appropriate lump sum price set forth in the Contract; or,

11.10.3. By the reasonable and fair estimated cost of such omitted work as

determined by the CONTRACTOR and the ENGINEER, and approved by the CITY.

ARTICLE 12 - CHANGE OF CONTRACT TIME

12.1. The Contract Time may only be changed by a Change Order or a Written Amendment. Any claim for an extension or shortening of the Contract time shall be based on written notice delivered by the party making the claim to the other party and to ENGINEER promptly (but in no event later than ten days) after the occurrence of the event giving rise to the claim and stating the general nature of the claim. Notice of the extent of the claim with supporting data shall be delivered within thirty days after such occurrence (unless ENGINEER allows an additional period of time to ascertain more accurate data in support of the claim) and shall be accompanied by the claimant's written statement that the adjustment claimed is the entire adjustment to which the claimant has reason to believe it is entitled as a result of the occurrence of said event. All claims for adjustment of the Contract Time shall be determined by ENGINEER in accordance with paragraph 9.11 if the CITY and CONTRACTOR cannot otherwise agree. No claim for an adjustment in the Contract Time will be valid if not submitted in accordance with the requirements of this paragraph 12.1.

12.2. The Contract Time will be extended in an amount equal to time lost due to delays caused by events beyond the control of CONTRACTOR if a claim is made thereof as provided in paragraph 12.1. Such events shall include, but not be limited to acts or neglect by the CITY or others performing additional work as contemplated by Article 7, or to fires, floods, labor disputes, epidemics, abnormal weather conditions or acts of God. If abnormal weather conditions are the basis for a Claim for additional time, such Claim shall be submitted within 30 days of occurrence and shall be documented by data substantiating that weather conditions were abnormal for the period of time required for completion of the Work and could not have been reasonably anticipated and that weather conditions had an adverse effect on the scheduled construction.

12.3. All time limits stated in the Contract Documents are of the essence of the Agreement. The provisions of this Article 12 shall not exclude recovery for damages (including but not limited to fees and charges of engineers, architects, attorneys and other professionals and court costs) for delay by either party.

12.4. The CONTRACTOR shall not be entitled to any claim for damages on account of hindrances or delays in construction from any cause whatsoever but if occasioned by any act of God, or by any act or omission on the part of the CITY, such act, hindrance or delay may entitle the CONTRACTOR to an extension of time in which to complete the work, provided that the CONTRACTOR gives notice in writing of the cause of such act, hindrance or delay within ten days after its occurrence to the CITY. This paragraph shall include but not be limited to any actions which result in delays in scheduling, substantial changes in scope or work or substantial increases in the cost of performing the work under the Contract Documents

ARTICLE 13 - WARRANTY AND GUARANTEE: TESTS AND INSPECTIONS, CORRECTION, REMOVAL OR ACCEPTANCE OF DEFECTIVE WORK

WARRANTY AND GUARANTEE:

13.1. CONTRACTOR warrants and guarantees to the CITY and ENGINEER that all Work will be constructed in accordance with the Contract Documents. Prompt notice of all defects shall be given to CONTRACTOR. All defective Work, whether or not in place, may be rejected, corrected or accepted as provided in Article 13. The guarantee shall remain in effect for one year from the date of final acceptance unless a longer period is specified. The CITY shall give notice of observed defects with reasonable promptness. Unremedied

defects identified for correction during the guarantee period but remaining after its expiration shall be considered as part of the obligations of the guarantee. Defects in material, workmanship or equipment which are remedied as a result of obligations of the guarantee shall subject the remedied portion of the work to an extended guarantee period of one year after the defect has been remedied. The Surety shall be bound with and for the Contractor in the Contractor's faithful observance of the guarantee.

ACCESS TO WORK:

13.2. ENGINEER'S and ENGINEER'S representatives, other representatives of the CITY, testing agencies and governmental agencies with jurisdictional interests will have access to the Work at reasonable times for their observation, inspecting and testing. CONTRACTOR shall provide proper and safe conditions for such access.

TESTS AND INSPECTIONS:

13.3. CONTRACTOR shall give ENGINEER timely notice of readiness of the Work for all required inspections, tests or approvals.

13.4. If Laws or Regulations of any public body having jurisdiction require any Work (or part thereof) to specifically be inspected, tested or approved, CONTRACTOR shall assume full responsibility therefor, pay all costs in connection therewith and furnish ENGINEER the required certificates of inspection, testing or approval. CONTRACTOR shall also be responsible for and shall pay all costs in connection with any inspection or testing required in connection with the CITY'S or ENGINEER'S acceptance of a Supplier of materials or equipment proposed to be incorporated in the Work, or of materials or equipment submitted for approval prior to CONTRACTOR'S purchase thereof for incorporation in the Work. The cost of all inspections, tests, and approvals in addition to the above which are required by the Contract Documents shall be paid as specified in the Contract Documents.

13.5. All inspections, tests or approvals other than those required by Laws or Regulations of any public body having jurisdiction shall be performed by organizations acceptable to the CITY (or by ENGINEER if so specified).

13.6. If any Work (including the work of others) that is to be inspected, tested or approved is

covered without written concurrence of ENGINEER, it must, if requested by ENGINEER, be uncovered for observation. Such uncovering shall be at CONTRACTOR'S expense unless CONTRACTOR has given ENGINEER timely notice of CONTRACTOR'S intention to cover the same and ENGINEER has not acted with reasonable promptness in response to such notice.

13.7. Neither observations by ENGINEER nor inspections, tests or approvals by others shall relieve CONTRACTOR from CONTRACTOR'S obligation's to perform the Work in accordance with the Contract Documents.

UNCOVERING WORK:

13.8. If any Work is covered contrary to the request of ENGINEER, it must, if requested by ENGINEER, be uncovered for ENGINEER'S observation and replaced, at CONTRACTOR'S expense.

13.9. If ENGINEER considers it necessary or advisable that covered Work be observed by ENGINEER or inspected or tested by others, CONTRACTOR, at ENGINEER'S request shall uncover, expose or otherwise make available for observation, inspection or testing as ENGINEER may require, that portion of the Work in question, furnishing all necessary labor, material and equipment. If it is found that such Work is defective, CONTRACTOR shall bear all direct, indirect and consequential costs of such uncovering, exposure, observation, inspection and testing and of satisfactory reconstruction, (including but not limited to fees and charges of engineers, architects, attorneys and other professionals), and the CITY shall be entitled to an appropriate decrease in the Contract Price, and, if the parties are unable to agree as to the amount thereof, may make a claim therefor as provided in Article 11. If, however, such Work is not found to be defective, CONTRACTOR shall be allowed an increase in the Contract

Price or an extension of the Contract time, or both, directly attributable to such uncovering, exposure, observation, inspection, testing and reconstruction; and if the parties are unable to agree as to the amount or extent thereof. CONTRACTOR may make a claim therefor as provided in Article 11 and 12.

CITY MAY STOP THE WORK:

13.10. If the Work is defective, or CONTRACTOR fails to supply sufficient skilled workers or suitable materials or equipment, or fails to furnish or perform the Work in such a way that the completed Work will conform to the Contract Documents, the CITY may order CONTRACTOR to stop the Work, or any portion thereof, until the cause for such order has been eliminated; however, this right of the CITY to stop the Work shall not give rise to any duty on the part of the CITY to exercise this right for the benefit of CONTRACTOR or any other party.

CORRECTION OR REMOVAL OF DEFECTIVE WORK:

13.11. If required by ENGINEER, CONTRACTOR shall promptly, as directed, either correct all defective Work, whether or not fabricated, installed or completed, or, if the Work has been rejected by ENGINEER, remove it from the site and replace it with non-defective Work. CONTRACTOR shall bear all direct, indirect, and consequential costs of such correction or removal (including but not limited to fees and charges of engineers, architects, attorneys and other professionals) made necessary thereby.

ONE YEAR CORRECTION PERIOD:

13.12. If within one year after the date of Substantial Completion or such longer period of time as may be prescribed by Laws or Regulations or by the terms of any applicable special guarantee required by the Contract Documents or by any specific provision of the Contract Documents, any Work is found to be defective, CONTRACTOR shall promptly, without cost to the CITY and in accordance with the CITY'S written instructions, either correct such defective Work, or, if it has been rejected by the

CITY, remove it from the site and replace it with non-defective Work. If CONTRACTOR does not promptly comply with the terms of such instructions or in an emergency where delay would cause serious risk of loss or damage, the CITY may have the defective Work corrected or the rejected Work removed and replaced, and all direct, indirect and consequential costs of such removal and replacement (including but not limited to fees and charges of engineers, architects, attorneys and other professionals) will be paid by CONTRACTOR. In special circumstances where a particular item of equipment is placed in continuous service before Substantial Completion of all the Work, the correction period for that item may start to run from an earlier date if so provided in the Specifications or by Written Amendment. Nothing herein shall be deemed a waiver of the statute of limitations as provided in Florida Law.

13.13. If instead of requiring correction or removal and replacement of defective Work, the CITY (and prior to ENGINEER'S recommendation of final payment) prefers to accept it, the CITY may do so. CONTRACTOR shall bear all direct, indirect and consequential costs attributable to the CITY'S evaluation of and determination to accept such defective Work (such costs to be approved by ENGINEER as to reasonableness and to include but not be limited to fees and charges of engineers, architects, attorneys and other professionals). If any such acceptance occurs prior to ENGINEER'S recommendation of final payment, a Change Order will be issued incorporating the necessary revisions in the Contract Documents with respect to the Work; and the CITY shall be entitled to an appropriate decrease in the Contract Price, and, if the parties are unable to agree as to the amount thereof, the CITY may make a claim therefor as provided in Article 11. If the acceptance occurs after such recommendation, an appropriate amount will be paid by CONTRACTOR to the CITY.

CITY MAY CORRECT DEFECTIVE WORK:

13.14. If CONTRACTOR fails within thirty days (30) after written notice of ENGINEER to proceed to correct and to correct defective Work or to remove and replace rejected Work as required by ENGINEER in accordance with paragraph 13.11, or if CONTRACTOR fails to perform the Work in accordance with the Contract Documents, or if

CONTRACTOR fails to comply with any other provision of the Contract Documents, the CITY may, after seven days written notice to CONTRACTOR, correct and remedy any such deficiency. In exercising the rights and remedies under this paragraph the CITY shall proceed expeditiously. To the extent necessary to complete corrective and remedial action, the CITY may exclude CONTRACTOR from all or part of the site, take possession of all or part of the Work, and suspend CONTRACTOR'S services related thereto, take possession of CONTRACTOR'S tools, appliances, construction equipment and machinery at the site and incomplete in the Work all materials and equipment stored at the site or for which the CITY has paid CONTRACTOR but which are stored elsewhere. CONTRACTOR shall allow the CITY, the CITY'S representative, agents and employees such access to the site as may be necessary to enable the CITY to exercise the rights and remedies under this paragraph. All direct, indirect and consequential costs of the CITY in exercising such rights and remedies will be charged against CONTRACTOR in an amount approved as to reasonableness by ENGINEER, and a Change Order will be issued incorporating the necessary revisions in the Contract Documents with respect to the Work; and the CITY shall be entitled to an appropriate decrease in the Contract Price, and, if the parties are unable to agree as to the amount thereof, the CITY may make a claim therefor as provided in Article 11. Such direct, indirect and consequential costs will include but not be limited to fees and charges of engineers, architects, attorneys and other professionals, all court costs and all costs of repair and replacement of work of other destroyed or damaged by correction, removal or replacement of CONTRACTOR'S defective Work. CONTRACTOR shall not be allowed an extension of the Contract Time because of any delay in performance of the Work attributable to the exercise by the CITY of the CITY'S rights and remedies hereunder.

ARTICLE 14 - PAYMENTS TO CONTRACTOR AND COMPLETION

SCHEDULE OF VALUES:

14.1. The schedule of values established as provided in paragraph 2.9 will serve as the basis for

progress payments and will be incorporated into a form of Application for Payment acceptable to ENGINEER. Progress payments on account of Unit Price Work will be based on the number of units completed.

APPLICATION FOR PROGRESS PAYMENTS:

14.2. Unless otherwise prescribed by law, at the end of each month, the CONTRACTOR shall submit to the Engineer for review, an Application for Progress Payment filled out and signed by the CONTRACTOR covering the Work completed as of the date of the Application and accomplished by such supporting documentation as is required by the Contract Documents. If payment is requested on the basis of materials and equipment not incorporated in the Work but delivered and suitably stored at the site or at another location agreed to in writing, the Application for Progress Payment shall also be accompanied by a Bill of Sale, paid invoice, or other documentation warranting that the CONTRACTOR has received the materials and equipment free and clear of all liens, charges, security interests, and encumbrances (which are hereinafter in these General Conditions referred to as "Liens") and evidence that the materials and equipment are covered by appropriate property insurance and other arrangements to protect the CITY'S interest therein, all of which shall be satisfactory to the CITY. The amount of retainage with respect to progress payments will be as stipulated in the Agreement.

CONTRACTOR'S WARRANTY OF TITLE:

14.3. CONTRACTOR warrants and guarantees that title to all Work, materials and equipment covered by any Application for Payment, whether incorporated in the Project or not, will pass to the CITY no later than the time of payment free and clear of Liens.

REVIEW OF APPLICATIONS FOR PROGRESS PAYMENT:

14.4. ENGINEER will, within ten days after receipt of each Application for Payment, either indicate in writing a recommendation of payment and present the Application to the CITY, or return the Application to CONTRACTOR indicating in writing ENGINEER'S reasons for refusing to recommend payment. In the latter case, CONTRACTOR may

make necessary corrections and resubmit the Application. Thirty days after receipt of the Application for Payment by the City with ENGINEER'S recommendation, the amount recommended will (subject to the provisions of the last sentence of paragraph 14.7) become due and when due will be paid by the CITY to CONTRACTOR.

14.5. ENGINEER'S recommendation of any payment requested in the Application for Payment shall not prohibit the City from withholding payment or prohibit the City from paying additionally sums regarding other matters or issues between the parties.

14.6. ENGINEER'S recommendation of final payment will constitute an additional representation by ENGINEER to the CITY that the conditions precedent to CONTRACTOR'S being entitled to final payment as set forth in paragraph 14.13 have been fulfilled.

14.7. ENGINEER may refuse to recommend the whole or any part of any payment if, in ENGINEER'S opinion, it would be incorrect to make such representations to the CITY. The ENGINEER may also refuse to recommend any such payment, or, because of subsequently discovered evidence or the results of subsequent inspections or tests, nullify any such payment previously recommended, to such extent as may be necessary in ENGINEER'S opinion to protect the CITY from loss, including but not limited to:

14.7.1. The Work is defective, or completed Work has been damaged requiring correction or replacement.

14.7.2. The Contract Price has been reduced by Written Amendment or Change Order.

14.7.3. The CITY has been required to correct defective Work or complete Work in accordance with paragraph 13.14, or

14.7.4. Of ENGINEER'S actual knowledge of the occurrence of any of the events enumerated in paragraphs 15.2.1 through 15.2.9 inclusive.

The CITY may refuse to make payment of the full amount recommended by the ENGINEER because claims have been made against the CITY on account of CONTRACTOR'S performance or furnishing of the Work, or there are other items entitling the CITY to credit against the amount recommended, but the CITY must give CONTRACTOR written notice (with a copy to ENGINEER) stating the reasons for such action.

SUBSTANTIAL COMPLETION:

14.8. When the CONTRACTOR considers the entire Work ready for its intended use, the CONTRACTOR shall notify the CITY and the ENGINEER in writing that the Work is substantially complete and request that the ENGINEER prepare a Certificate of Substantial Completion. Within a reasonable time thereafter, the CITY, the ENGINEER and the CONTRACTOR shall make an inspection of the Work to determine the status of completion. If the ENGINEER does not consider the Work substantially complete, (it is not ready for its intended use) the ENGINEER shall notify the CONTRACTOR in writing giving the reasons therefor. If the ENGINEER considers the Work to be substantially complete, the ENGINEER will prepare and deliver to the CITY for its execution and recordation the Certificate of Substantial Completion signed by the ENGINEER and CONTRACTOR, which shall fix the Date of Substantial Completion.

14.9. The CITY shall have the right to exclude CONTRACTOR from the Work after the date of Substantial Completion, but the CITY shall allow CONTRACTOR reasonable access to complete or correct items on the "punch list".

PARTIAL UTILIZATION:

14.10. Use by the CITY of any finished part of the Work, which has specifically been identified in the Contract Documents, or which the CITY, ENGINEER and CONTRACTOR agree constitutes a separately functioning and useable part of the Work that can be used by the CITY without significant interference with CONTRACTOR'S performance of the remainder of the Work, may be accomplished prior to Substantial Completion of all Work subject to the following:

14.10.1. The CITY at any time may request CONTRACTOR in writing to permit the CITY to use any such part of the Work which the CITY believes to be ready for its intended use and substantially complete. If CONTRACTOR agrees, CONTRACTOR will certify to the CITY and ENGINEER that said part of the Work is substantially complete and request ENGINEER to issue a certificate of Substantial Completion for that part of the Work. CONTRACTOR at any time may notify the CITY and ENGINEER in writing that CONTRACTOR considers any such part of the Work ready for its intended use and substantially complete and request ENGINEER to issue a certificate of Substantial Completion for that part of the Work. Within a reasonable time after either such request, the CITY, CONTRACTOR and ENGINEER shall make an inspection of that part of Work to determine its status of completion. If ENGINEER does not consider that part of the Work to be substantially complete, ENGINEER will notify the CITY and CONTRACTOR in writing giving the reasons therefor. If ENGINEER considers that part of the Work to be substantially complete, the provisions of paragraphs 14.8 and 14.9 will apply with respect to certification of Substantial Completion of that part of the Work and the division of responsibility in respect thereof and access thereto.

14.10.2. The CITY may at any time request CONTRACTOR in writing to permit the CITY to take over operation of any such part of the Work although it is not substantially complete. A copy of such request will be sent to ENGINEER and within a reasonable time thereafter the CITY, CONTRACTOR and ENGINEER shall make an inspection of that part of the Work to determine its status of completion and will prepare a list of items remaining to be completed or corrected thereon before final payment. If CONTRACTOR does not object in writing to the CITY and ENGINEER that such part of the Work is not ready for separate operation by the CITY, ENGINEER will finalize the list of items to be completed or corrected and will deliver such list to the CITY and CONTRACTOR together with a written

recommendation as to the division of responsibilities pending final judgment between the CITY and CONTRACTOR with respect to security, operation, safety, maintenance, utilities, insurance, warranties and guarantees for that part of the Work which will become binding upon the CITY and CONTRACTOR at the time when the CITY takes over such operation (unless they shall have otherwise agreed in writing and so informed ENGINEER). During such operation and prior to Substantial Completion of such part of the Work, the CITY shall allow CONTRACTOR reasonable access to complete or correct items on said list and to complete other related Work.

FINAL INSPECTION:

14.11. Upon written notice from CONTRACTOR that the entire Work or an agreed portion thereof is complete, ENGINEER will make a final inspection with the CITY and CONTRACTOR and will notify CONTRACTOR in writing of all particulars in which this inspection reveals that the Work is incomplete, defective, or not in accordance with the Contract Documents. CONTRACTOR shall immediately take such measures as are necessary to remedy such deficiencies.

FINAL APPLICATION FOR PAYMENT:

14.12. After CONTRACTOR has completed in writing all such corrections to the satisfaction of ENGINEER and delivered all maintenance and operating instructions, schedules, guarantees, Bonds, certificates of inspection, marked-up record documents (as provided in paragraph 6.19) and other documents all as required by the Contract Documents, and after ENGINEER has indicated in writing that the Work is acceptable and has been completed in conformance with the drawings and specifications and any approved changes thereto, CONTRACTOR may make application for final payment following the procedure for progress payments. The final Application for Payment shall be accompanied by all documentation called for in the Contract Documents.

FINAL PAYMENT AND ACCEPTANCE:

14.13. Upon receipt of written notice from the CONTRACTOR that the Work has been completed in conformity with the Drawings and Specifications and any approved changes thereto, and receipt of the Final Application for Payment and accompanying documentation, the ENGINEER shall promptly examine the Work and, making such tests as he may deem proper and using all of the care and judgment normally exercised in the examination of completed Work by a properly qualified and experienced Professional ENGINEER, shall satisfy himself that the CONTRACTOR'S statement appears to be correct and the CONTRACTOR'S other obligations under the Contract Documents have been fulfilled. He shall then inform the CITY in writing that he has examined the Work and that it appears, to the best of his knowledge and belief, to conform to the Contract Drawings, Specifications and any approved Change Orders, that the CONTRACTORS other obligations under the Contract Documents have been fulfilled, and that he therefore recommends acceptance of the Work for ownership and Final Payment to the CONTRACTOR. However, it is agreed by the CITY and the CONTRACTOR that such statement by the ENGINEER does not in any way relieve the CONTRACTOR from his responsibility to deliver a fully completed job in a good and workmanlike condition, and does not render the ENGINEER or the CITY liable for any faulty Work done or defective materials or equipment used by the CONTRACTOR.

Upon final completion and acceptance of the Work in accordance with Paragraph 14.13 of the General Conditions, the CITY shall pay the remainder of the contract price as recommended by ENGINEER as provided in said paragraph 14.13. Prior to final payment, the CONTRACTOR must provide the CITY with waivers of any and all claims and liens from the CONTRACTOR and any and all subcontractors, sub-subcontractors, laborers, or. These waivers are conditions precedent to final payment. The CITY may withhold amounts it deems necessary to cover any claims of which it has been notified of subcontractors, sub-subcontractors, materialmen, suppliers or others from final payment to the CONTRACTOR

The ENGINEER will then make a final estimate of the value of all Work done and will deduct therefrom all previous payments which have been made. The ENGINEER will report such estimate to the CITY together with his

recommendation as to the acceptance of the Work or his findings as to any deficiencies therein. After receipt and acceptance by the CITY of the properly executed Final Warranty of Title and after approval of the ENGINEER'S estimate and recommendation to the CITY, the CITY will make final payment to the CONTRACTOR of the Amount remaining after deducting all prior payments and all amounts to be kept or retained under the provisions of the Contract Documents, including, but not limited to, Liquidated Damages, as applicable.

All prior estimates are subject to correction in the final estimate. Thirty days after approval by the CITY of the application for final payment, the amount recommended by ENGINEER shall become due and will be paid to Contractor.

CONTRACTOR'S CONTINUING OBLIGATION:

14.14. CONTRACTOR'S obligation to perform and complete the Work in accordance with the Contract Documents shall be absolute. Neither recommendation of any progress or final payment by ENGINEER, nor the issuance of a Certificate of Substantial Completion, nor any payment by the CITY to CONTRACTOR under the Contract Documents, nor any use or occupancy of the Work or any part thereof by the CITY, nor any act of acceptance by the CITY nor any failure to do so, nor any review and approval of a Shop Drawing or sample submission, nor the issuance of a notice of acceptability by ENGINEER pursuant to paragraph 14.13, nor any correction of defective Work by the CITY will constitute an acceptance of Work not in accordance with the Contract Documents or a release of CONTRACTOR'S obligation to perform the Work in accordance with the Contract Documents.

ARTICLE 15 - SUSPENSION OF WORK AND TERMINATION

CITY MAY SUSPEND WORK:

15.1. The CITY may, at any time and without cause, suspend the Work or any portion thereof for a period of not more than ninety days by notice in writing to CONTRACTOR and ENGINEER which will fix the date on which Work will be resumed. CONTRACTOR shall resume the Work on the date so fixed. CONTRACTOR shall be allowed an increase in the Contract Price or an extension of the Contract Time, or both, directly attributable to any suspension if CONTRACTOR makes an approved claim therefor as provided in Articles 11 and 12.

CITY MAY TERMINATE

15.2. Upon the occurrence of any one or more of the following events:

15.2.1. If CONTRACTOR commences a voluntary case under any chapter of the Bankruptcy Code (Title 11, United States Code), as now or hereafter in effect, or if CONTRACTOR takes any equivalent or similar action by filing a petition or otherwise under any other federal or state law in effect at such timing relating to the bankruptcy or insolvency;

15.2.2. If a petition is filed against CONTRACTOR under any chapter of the Bankruptcy Code as now or hereafter in effect at the time of filing, or if a petition is filed seeking any such equivalent or similar relief against CONTRACTOR under any other federal or state law in effect at the time relating to bankruptcy or insolvency;

15.2.3. If CONTRACTOR makes a general assignment for the benefit of creditors;

15.2.4. If a trustee, receiver, custodian or agent of CONTRACTOR is appointed under applicable law or under contract, whose appointment or authority to take charge of property of CONTRACTOR is for the purpose of enforcing a Lien against such property or for the purpose of general administration of such property for the benefit of CONTRACTOR'S creditors;

15.2.5. If CONTRACTOR admits in writing an inability to pay its debts generally as they become due;

15.2.6. If CONTRACTOR fails to perform the Work in accordance with the Contract Documents (including, but not limited to, failure to supply sufficient skilled workers or suitable materials or equipment or failure to adhere to the progress schedule established under paragraph 2.9 as revised from time to time);

15.2.7. If CONTRACTOR disregards Laws or Regulations of any public body having jurisdiction;

15.2.8. If CONTRACTOR disregards the authority of ENGINEER; or

15.2.9. If CONTRACTOR otherwise violates any provisions of the Contract Documents;

The CITY may, after giving CONTRACTOR and Surety seven days written notice of any default and to the extent permitted by Laws and Regulations, terminate the services of CONTRACTOR, exclude CONTRACTOR from the site and take possession of the Work and of all CONTRACTOR'S tools, appliances, construction equipment and machinery at the site and use the same to the full extent they could be used by CONTRACTOR (without liability to CONTRACTOR for trespass or conversion), incorporate in the Work all materials and equipment stored at the site or for which the CITY has paid CONTRACTOR but which are stored elsewhere, and finish the Work as the CITY may deem expedient. In such case CONTRACTOR shall not be entitled to receive any further payment until the Work is finished. If the unpaid balance of the Contract Price exceeds the expense of completing the work including compensation for additional managerial and administrative services, plus the CITY'S direct, indirect and consequential losses, damages and costs because of the CONTRACTOR'S default (including but not limited to fees and charges of engineers, architects, attorneys, and other professionals and court costs) such excess will be paid to CONTRACTOR. If such expenses and costs plus the CITY'S losses and damages exceed such unpaid balance, CONTRACTOR shall pay the difference to

the CITY promptly on demand. Such costs incurred by the CITY will be approved as to reasonableness by ENGINEER and incorporated in a Change Order, but when exercising any rights or remedies under this paragraph the CITY shall not be required to obtain the lowest price for the work performed.

15.3. Where CONTRACTOR'S services have been so terminated by the CITY, the termination will not affect any rights or remedies of the CITY against CONTRACTOR then existing or which may thereafter accrue. Any retention or payment of moneys due CONTRACTOR by the CITY will not release CONTRACTOR from liability.

15.4. The CITY may terminate this Contract without cause by giving seven (7) days prior written notice to the Contractor, and in such event, the CITY will pay the CONTRACTOR for that portion of the Contract Sum, less the aggregate of previous payments, allocable to the Work completed as of the Date of Termination, plus reasonable termination expenses. The CITY also will reimburse the CONTRACTOR for all costs necessarily incurred for organizing and carrying out the stoppage of the Work and paid directly by the CONTRACTOR, not including overhead, general expenses or profit. The CITY will not be responsible to reimburse the CONTRACTOR for any continuing contractual commitments to subcontractors or material men or for penalties or damages for canceling such contractual commitments, (with the exception that the CITY shall reimburse the CONTRACTOR for major materials or equipment purchased before termination if the CONTRACTOR can show proof of said purchases prior to notice of termination) inasmuch as the CONTRACTOR shall make all subcontracts and other commitments subject to this provision. In the event of termination by the CITY, the CITY may require the CONTRACTOR promptly to assign to it all or some subcontracts, construction, plant, materials, tools, equipment, appliances, rental agreements, and other commitments which the CITY, in its sole discretion, chooses to take by assignment, and in such event the CONTRACTOR shall promptly execute and deliver to the CITY written assignments of the same.

CONTRACTOR MAY STOP WORK OR TERMINATE:

15.5. If, through no act or fault of CONTRACTOR, the Work is suspended for a period of more than ninety (90) days by the CITY or under an order of court or other public authority, or ENGINEER fails to act on any Application for Payment within thirty (30) days after it is submitted, or the CITY fails for sixty (60) days to pay CONTRACTOR any sum finally determined to be due, then CONTRACTOR may, upon seven (7) days written notice to the CITY and ENGINEER, terminate the Agreement and the CITY will pay the CONTRACTOR for that portion of the Contract Sum, less the aggregate of previous payments, allocable to the work completed as of the Date of Termination plus reasonable termination expenses. The CITY will not be responsible to reimburse the CONTRACTOR for any continuing contractual commitments for canceling such contractual commitments inasmuch as the CONTRACTOR shall make all subcontracts and other commitments subject to this provision. The CITY may require the CONTRACTOR promptly to assign to it all or some subcontracts, construction, plant, materials, tools, equipment, appliances, rental agreements, and any other commitments which the CITY, in its sole discretion, chooses to take by assignment, and in such event the CONTRACTOR shall promptly execute and deliver to the CITY written assignments of the same. In addition and in lieu of terminating the Agreement, if ENGINEER has failed to act on an Application for Payment or the CITY has failed to make any payment as aforesaid, CONTRACTOR may upon seven (7) days written notice to the CITY and ENGINEER stop the Work until payment of all amounts then due. The provisions of this paragraph shall not relieve CONTRACTOR of the obligations under paragraph 6.29 to carry on the Work in accordance with the progress schedule and without delay during disputes and disagreements with the CITY.

ARTICLE 16 - MISCELLANEOUS

GIVING NOTICE:

16.1. Whenever any provision of the Contract Documents requires the giving of written notice, it will be deemed to have been validly given if delivered in person to the individual or to a member of the firm or to an officer of the corporation for whom it is intended, or if delivered at or sent by

registered or certified mail, postage prepaid, to the last business address known to the giver of the notice.

COMPUTATION OF TIME:

16.2. When any period of time is referred to in the Contract Documents by days, it will be computed to exclude the first and include the last day of such period. If the last day of any such period falls on a Saturday or Sunday or on a day made a legal holiday by the law of the applicable jurisdiction, such day will be omitted from the computation.

NO LIMITATION OF RIGHTS AND REMEDIES:

16.3. The duties and obligations imposed by these General Conditions and the rights and remedies available hereunder to the parties hereto, and, in particular but without limitation, the warranties, guarantees and obligations imposed upon CONTRACTOR by paragraphs 6.30, 13.1, 13.12, 13.14, 14.3 and 15.2 and all of the rights and remedies available to the CITY and ENGINEER thereunder, are in addition to , and are not to be construed in any way as a limitation of, any rights and remedies available to any or all of them which are otherwise imposed or available by Laws or Regulations, by special warranty or guarantee or by other provisions of the Contract Documents, and the provisions of this paragraph will be as effective as if repeated specifically in the Contract Documents in connection with each particular duty obligation, right and remedy to which they apply. All representations warranties and guarantees made in the Contract Documents will survive final payment and termination or completion of the Agreement.

ACCIDENT AND PREVENTION:

16.4. The safety provisions of applicable laws and building and construction codes shall be observed by CONTRACTOR and the Contractor shall take or cause to be taken such additional safety and health measures as the Local Public Agency involved may determine to be reasonably necessary. Machinery, equipment and all hazards shall be guarded in accordance with the safety provisions of the "Manual of Accident Prevention in Construction" as published by the Associated General Contractors

of America, Inc. to the extent that such provisions are not in conflict with applicable laws. The Contractor shall maintain an accurate record of all cases of death, occupational disease, or injury requiring medical attention or causing loss of time from work, arising out of and in the course of employment on Work under the Contract. The Contractor shall promptly furnish the Local Public Agency with reports concerning these matters.

16.5. In the event the CITY is prevented from proceeding with any or all of this Work as stated in this Contract, due to a declaration of war, or national emergency, by the United States government, whereas the construction of the type contracted for herein is specifically prohibited by statute or governmental edict, or due to the stoppage of construction caused by any governmental agency, State, City, Town, or County regulations, orders, restrictions, or due to circumstances beyond the CITY'S control, then the CITY herein reserves the right to either suspend the Work to be done for an indefinite period of time or to cancel this Agreement outright by giving notice by registered mail of such intention to the CONTRACTOR herein. In the event of any conditions above mentioned occurring after the Work herein has already been commenced, then the CITY herein shall be liable for only the cancellation or suspension without the addition of prospective profits or other changes whatsoever.

FLORIDA PRODUCTS AND LABOR

16.6. The CONTRACTOR'S attention is called to Section 255.04, Florida Statutes, which requires that on public building contracts, Florida products and labor shall be used wherever price and quality are equal.

EMPLOYEES:

16.7. All labor described in these specifications or indicated on the Drawings and the Work specified or indicated shall be executed in a thoroughly substantial and workmanlike manner by mechanics skilled in the applicable trades.

16.8. Any person employed on the Work who fails, refuses or neglects to obey the instructions of the CONTRACTOR in anything relating to this Work or who appears to the CITY to be disorderly, intoxicated, insubordinate, or incompetent, shall upon

the order of the CITY, be at once discharged and not again employed in any part of the Work. Any interference with, or abuse or threatening conduct toward the CITY, ENGINEER or their inspectors by the CONTRACTOR or his employees or agents, shall be authority for the CITY to annul the Contract and re-let the Work. No intoxicating substance shall be allowed on the Work site.

NON-DISCRIMINATION:

16.9. The CONTRACTOR shall not discriminate against employees or applicants for employment because of race, creed, color, religion, sex, age, handicapped status, disabilities, or national origin. The CONTRACTOR will endeavor to ensure that applicants are employed and that employees are treated during employment, without regard to their race, creed, color, religion, sex, age, handicapped status, or national origin. Such action shall include but not be limited to the following: employment, upgrading, demotion, or transfer; recruitment advertising; layoff or termination; rates of pay or other forms of compensation; and selection for training including apprenticeship. The CONTRACTOR agrees to post in conspicuous places, available to employees and applicants for employment, notices setting forth the provisions of this nondiscrimination clause. These provisions apply to all subcontractors as well.

ASSIGNMENT:

16.10. This Agreement, nor any monies due hereunder, or any part thereof, shall not be assigned, or transferred, by CONTRACTOR, nor shall the CITY be liable to any assignee or transferee, without the written consent of the CITY, to the assignment, or transfer. The CITY shall not release or discharge CONTRACTOR from any obligation hereunder. The CITY shall not approve an assignment or transfer unless the Surety on the Contract Performance and Payment Bonds has informed the CITY in writing that it consents to the assignment or transfer.

VENUE:

16.11. This Agreement shall be governed by the laws of the State of Florida as now and hereafter in force. The venue for actions arising out of this Agreement is fixed in Nassau County, Florida.

ASBESTOS:

16.12. If the CONTRACTOR during the course of the Work observes the existence of asbestos in any structure, building or facility, the CONTRACTOR shall promptly notify the CITY and the ENGINEER. The CITY shall consult with the ENGINEER regarding removal or encapsulation of the asbestos material and the CONTRACTOR shall not perform any Work pertinent to the asbestos material prior to receipt of special instructions from the CITY through the ENGINEER.

RIGHT TO AUDIT:

16.13. If the CONTRACTOR submits a claim to the CITY for additional compensation, the CITY shall have the right, as a condition to considering the claim, and as a basis for evaluation of the claim, and until the claim has been settled, to audit the CONTRACTOR'S books to the extent they are relevant. This right shall include the right to examine books, records, documents, and other evidence and accounting procedures and practices, sufficient to discover and verify all direct and indirect costs of whatever nature claimed to have been incurred or anticipated to be incurred and for which claim has been submitted. The right to audit shall include the right to inspect the CONTRACTOR'S plants, or such parts thereof, as may be or have been engaged in the performance of the Work. The CONTRACTOR further agrees that the right to audit encompasses all subcontracts and is binding upon all subcontractors. The rights to examine and inspect herein provided for shall be exercisable through such representatives as the CITY deems desirable during the CONTRACTOR'S normal business hours at the office of the CONTRACTOR. The accounting records and documents, and other financial data, and upon request, shall submit true copies of requested records to the CITY.

SECTION 01 10 00

SUMMARY

PART 1 GENERAL

1.01 PROJECT

- A. Project Name:
 - 1. Nassau County Library, Fernandina Beach Branch:
 - a. Demolition, Renovations, Additions, HVAC, Fire Sprinkler System and related Site Work.
- B. Owner's Name: City of Fernandina Beach, Florida.
- C. Architect's Name: VRL Architects, Inc.
- D. Project Description: This project includes Demolition and Renovations to the existing Fernandia Beach Branch Library with related adjacent site improvement modifications..

1.02 CONTRACT DESCRIPTION

- A. Contract Type: A single prime contract based on a Stipulated Price as described in General Conditions Document..
- B. This Project will comply with Sustainable Design: Florida Green Commercial Building Certification Standard requirements of the Florida Green Building Coalition (FGBC) as specified herein for construction contractor requirements, documentation, products, systems, submittals and construction operations. It will be the responsibility of the contractor to follow the requirements of this specification for purposes of selecting products, systems and construction practices applicable to this project. FGBC Certification Documentation of the project is not required.

1.03 DESCRIPTION OF WORK

- A. Scope of demolition and removal work is shown on drawings and specified in Section 02 41 00.
- B. Scope of demolition and remodeling work is shown on drawings.
- C. Addition Construction and Renovate the following areas, complete including operational mechanical and electrical work, finishes, and Fire Sprinkler system:
 - 1. New Addition to existing Library building.
 - 2. Renovation in various areas of the existing building.
 - 3. New HVAC, Fire Alarm, Lighting, Electrical, Plumbing, Fire Sprinkler system.
 - 4. Related Site Work.
- D. Plumbing: Alter existing system and add new construction, keeping existing in operation.
- E. HVAC: Alter existing system and add new construction, keeping existing in operation.
- F. Electrical Power and Lighting: Alter existing system and add new construction, keeping existing in operation.
- G. Fire Suppression Sprinklers: Provide new Fire Sprinkler system to both existing and new construction areas.
- H. Fire Alarm: Alter existing system and add new construction, keeping existing in operation.
- I. Telephone and Data: Provide raceways for owner provided systems. Keep existing systems in operation.

1.04 WORK BY OWNER

- A. Nassau County as library occupant will award a contract which will be bid separately for supply and installation of new and restored furnishings and shelving which will be coordinated with the construction schedule.
- B. Nassau County as library occupant will remove, relocate, store, dispose of all existing loose furnishings and equipment in the building prior to construction of each Phase of new construction or renovation work.
- C. Items noted OFOI (Owner Furnished Owner Installed) will be supplied and installed by Nassau County as library occupant before Substantial Completion.
 - 1. Movable cabinets.
 - 2. Furnishings.
 - 3. Small plug-in equipment.
 - 4. Selected Kitchen Equipment as scheduled.
 - 5. New Bike Rack.
- D. Nassau County as library occupant will supply and install the following:
 - 1. Data Systems including copper wiring and termination of fibre optic lines related to data.
 - 2. Telephone System including wiring.

1.05 OWNER OCCUPANCY

- A. Nassau County as library occupant intends to continue to occupy adjacent portions of the existing facility during the entire construction period.
- B. Facilities, or portions of facilities shall not be occupied during construction, unless exits, fire detection and early warning systems, fire protection, and safety barriers are continuously maintained and clearly marked at all times.
- C. City of Fernandina Beach, Florida intends to occupy each portion of the Project upon Substantial Completion.
- D. Cooperate with City of Fernandina Beach, Florida to minimize conflict and to facilitate City of Fernandina Beach, Florida's operations.
- E. Schedule the Work to accommodate City of Fernandina Beach, Florida occupancy.

1.06 CONTRACTOR USE OF SITE AND PREMISES

- A. Construction Operations: Limited to areas noted on Drawings.
- B. Arrange use of site and premises to allow:
 - 1. City of Fernandina Beach, Florida and Nassau County as library occupant, occupancy.
 - 2. Work by City of Fernandina Beach, Florida and Nassau County as library occupant.
 - 3. Use of site and premises by the public.
 - 4. Work by others.
- C. Provide access to and from site as required by law and by City of Fernandina Beach, Florida:
 - 1. Emergency Building Exits During Construction: Keep all exits required by code open during construction period; provide temporary exit signs if exit routes are temporarily altered.
 - 2. Do not obstruct roadways, sidewalks, or other public ways without permit.
 - 3. The Owner will coordinate access for stipulated Contractor work on weekends, holidays, and after hours to assist the Contractor in achieving the project schedule requirements, if additional work time is required. No additional contract cost or project time will be permitted for such work.
- D. Existing building spaces may not be used for storage.
- E. Utility Outages and Shutdown:
 - 1. Limit disruption of utility services to hours the building is unoccupied.

EXHIBIT "A"

2. Do not disrupt or shut down life safety systems, including but not limited to fire sprinklers and fire alarm system, without coordination of notice to City of Fernandina Beach, Florida and Nassau County as library occupant, and authorities having jurisdiction.
3. Prevent accidental disruption of utility services to other facilities.

1.07 BUILDING CODE

- A. Florida Building Code 2010, with the 2010 Supplements and Florida Fire Protection Code 2010.
- B. All exterior building envelope products shall be provided with Florida Building Code product approval numbers in accord with: Florida Building Code 2010. Products without Florida Product Approval Numbers Will Not be Accepted for This Project. This requirement includes the following specification sections:
 1. Section - 05 12 00 Structural Steel Framing
 2. Section - 05 21 00 Steel Joist Framing
 3. Section - 05 31 00 Steel Decking
 4. Section - 05 40 00 Cold-Formed Metal Framing
 5. Section - 05 50 00 Metal Fabrications
 6. Section - 07 52 00 Modified Bituminous Membrane Roofing
 7. Section - 07 62 00 Sheet Metal Flashing and Trim
 8. Section - 07 90 05 Joint Sealers
 9. Section - 08 11 13 Hollow Metal Doors and Frames
 10. Section - 08 51 13 Aluminum Windows and Doors
 11. Section - 08 80 00 Glazing
- C. Project location is within Nassau County 130 MPH (Vult.), pressure loads as indicated on Structural Wind Loads, and Component and Cladding Pressure Diagram on drawings all exterior envelope products are to meet test requirements for Certification by Florida Product Approval or NOA requirements. See Figure 1609B category III FBC.
- D. Wind -Borne Debris Impact Protection is not required in this risk category II and III facility under FBC 1609.2 using figure 1609A for 130 MPH (Vult.) wind zone.

1.08 DRESS CODE AND CONDUCT

- A. All workmen on the construction site shall wear a shirt at all times. No workmen shall engage in any verbal expressions or physical gestures directed towards all visitors, employees of Owner or any other person at this construction site which may be considered sexual harassment. Any person found engaging in any offensive conduct will be banned from this construction site.

1.09 WORK SEQUENCE

- A. Construct Work in Tasks during the construction period:
 1. Task 1: Existing operation of the existing Fernandina Beach Public Library cannot be interrupted until after occupancy of the Phase I New Addition. Substantially complete for occupancy the Fernandina Beach Branch Library Addition and related site work in the Project not later than 210 calendar days from Notice to Proceed.
 2. Task 2: Substantially Complete for occupancy The Fernandina Beach Branch Phase II Existing Facility Renovations after occupancy of the Phase I New Addition and remaining site work in the project not later than 360 Calendar Days after Initial Notice to Proceed.
- B. Coordinate construction schedule and operations with City of Fernandina Beach, Florida and Nassau County as library occupant.

END OF SECTION

SECTION 01 20 00

PRICE AND PAYMENT PROCEDURES

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Procedures for preparation and submittal of applications for progress payments.
- B. Documentation of changes in Contract Sum and Contract Time.
- C. Change procedures.
- D. Correlation of Contractor submittals based on changes.
- E. Procedures for preparation and submittal of application for final payment.

1.02 SCHEDULE OF VALUES

- A. Electronic media printout including equivalent information will be considered in lieu of standard form specified; submit sample to Architect for approval.
- B. Forms filled out by hand will not be accepted.
- C. Submit a printed schedule on AIA Form G703 - Application and Certificate for Payment Continuation Sheet. Contractor's standard form or electronic media printout will be considered.
- D. Submit Schedule of Values in duplicate within 15 days after date of Owner-Contractor Agreement.
- E. Revise schedule to list approved Change Orders, with each Application For Payment.

1.03 APPLICATIONS FOR PROGRESS PAYMENTS

- A. Payment Period: Submit at intervals stipulated in the Agreement.
- B. Electronic media printout including equivalent information will be considered in lieu of standard form specified; submit sample to Architect for approval.
- C. Forms filled out by hand will not be accepted.
- D. Present required information in typewritten form.
- E. Form: AIA G702 Application and Certificate for Payment and AIA G703 - Continuation Sheet including continuation sheets when required.
- F. Execute certification by signature of authorized officer.
- G. Use data from approved Schedule of Values. Provide dollar value in each column for each line item for portion of work performed and for stored Products.
- H. List each authorized Change Order as a separate line item, listing Change Order number and dollar amount as for an original item of Work.
- I. Submit five copies of each Application for Payment.
- J. Include the following with the application:
 - 1. Transmittal letter as specified for Submittals in Section 01 30 00.
 - 2. Construction progress schedule, revised and current as specified in Section 01 30 00.
 - 3. Current construction photographs specified in Section 01 30 00.
 - 4. Partial release of liens from major Subcontractors and vendors.
 - 5. FGBC Commercial Certification submittals applicable to work for which shop drawing or application being made.

- 6. Affidavits attesting to off-site stored products.
- K. When Architect requires substantiating information, submit data justifying dollar amounts in question. Provide one copy of data with cover letter for each copy of submittal. Show application number and date, and line item by number and description.

1.04 MODIFICATION PROCEDURES

- A. For minor changes not involving an adjustment to the Contract Price or Contract Time, Architect will issue instructions directly to Contractor.
- B. Architect will advise of minor changes in the Work not involving an adjustment to Contract Sum or Contract Time as authorized by the Conditions of the Contract by issuing supplemental instructions on AIA Form G710.
- C. For other required changes, Architect will issue a document signed by City of Fernandina Beach, Florida instructing Contractor to proceed with the change, for subsequent inclusion in a Change Order.
 - 1. The document will describe the required changes and will designate method of determining any change in Contract Sum or Contract Time.
 - 2. Promptly execute the change.
- D. For changes for which advance pricing is desired, Architect will issue a document that includes a detailed description of a proposed change with supplementary or revised drawings and specifications, a change in Contract Time for executing the change with a stipulation of any overtime work required and the period of time during which the requested price will be considered valid. Contractor shall prepare and submit a fixed price quotation within 10 days.
- E. Contractor may propose a change by submitting a request for change to Architect, describing the proposed change and its full effect on the Work, with a statement describing the reason for the change, and the effect on the Contract Sum and Contract Time with full documentation and a statement describing the effect on Work by separate or other contractors. Document any requested substitutions in accordance with Section 01 60 00.
- F. Computation of Change in Contract Amount: As specified in the Agreement and Conditions of the Contract.
 - 1. For change requested by Architect for work falling under a fixed price contract, the amount will be based on Contractor's price quotation.
 - 2. For change requested by Contractor, the amount will be based on the Contractor's request for a Change Order as approved by Architect.
- G. Substantiation of Costs: Provide full information required for evaluation.
 - 1. provide following data:
 - a. Quantities of products, labor, and equipment.
 - b. Taxes, insurance, and bonds.
 - c. Overhead and profit.
 - d. Justification for any change in Contract Time.
 - e. Credit for deletions from Contract, similarly documented.
- H. Execution of Change Orders: Architect will issue Change Orders for signatures of parties as provided in the Conditions of the Contract.
- I. After execution of Change Order, promptly revise Schedule of Values and Application for Payment forms to record each authorized Change Order as a separate line item and adjust the Contract Sum.
- J. Promptly revise progress schedules to reflect any change in Contract Time, revise sub-schedules to adjust times for other items of work affected by the change, and resubmit.

K. Promptly enter changes in Project Record Documents.

1.05 APPLICATION FOR FINAL PAYMENT

- A. Prepare Application for Final Payment as specified for progress payments, identifying total adjusted Contract Sum, previous payments, and sum remaining due.
- B. Application for Final Payment will not be considered until the following have been accomplished:
 - 1. All closeout procedures specified in Section 01 70 00.

END OF SECTION

SECTION 01 30 00

ADMINISTRATIVE REQUIREMENTS

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Preconstruction meeting.
- B. Site mobilization meeting.
- C. Progress meetings.
- D. Construction progress schedule.
- E. Progress photographs.
- F. Submittals for review, information, and project closeout.
- G. Number of copies of submittals.
- H. Submittal procedures.

PART 2 PRODUCTS - NOT USED

PART 3 EXECUTION

3.01 PRECONSTRUCTION MEETING

- A. Architect will schedule a meeting after Notice of Award.
- B. Attendance Required:
 - 1. City of Fernandina Beach, Florida.
 - 2. Nassau County as Library Occupant
 - 3. Architect.
 - 4. Contractor.
 - 5. Major Sub-Contractors.
- C. Agenda:
 - 1. Execution of City of Fernandina Beach, Florida-Contractor Agreement.
 - 2. Submission of executed bonds and insurance certificates.
 - 3. Distribution of Contract Documents.
 - 4. Submission of list of Subcontractors, schedule of values, and progress schedule.
 - 5. Designation of personnel representing the parties to Contract, Engineer and Architect.
 - 6. Procedures and processing of field decisions, submittals, substitutions, applications for payments, proposal request, Change Orders, and Contract closeout procedures.
 - 7. Scheduling.
- D. Record minutes and distribute copies within two days after meeting to participants, with two copies to Architect, City of Fernandina Beach, Florida, participants, and those affected by decisions made.

3.02 SITE MOBILIZATION MEETING

- A. Architect will schedule a meeting at the Project site prior to Contractor occupancy.
- B. Attendance Required:
 - 1. Contractor.
 - 2. City of Fernandina Beach, Florida.
 - 3. Nassau County as Library Occupant
 - 4. Architect.

5. Consultants.
6. Contractor's Superintendent.
7. Major Subcontractors.

C. Agenda:

1. Use of premises by City of Fernandina Beach, Florida, Nassau County as library occupant and Contractor.
2. City of Fernandina Beach, Florida's requirements and occupancy prior to completion.
3. Construction facilities and controls provided by City of Fernandina Beach, Florida.
4. Temporary utilities provided by City of Fernandina Beach, Florida.
5. Survey and building layout.
6. Security and housekeeping procedures.
7. Schedules.
8. Application for payment procedures.
9. Procedures for testing.
10. Procedures for maintaining record documents.
11. Requirements for start-up of equipment.
12. Inspection and acceptance of equipment put into service during construction period.

- D. The Contractor shall record minutes and distribute copies within two days after meeting to participants, with two copies to Architect, City of Fernandina Beach, Florida, participants, and those affected by decisions made.

3.03 PROGRESS MEETINGS

- A. Schedule and administer meetings throughout progress of the Work at maximum monthly intervals.
- B. Make arrangements for meetings, prepare agenda with copies for participants, preside at meetings.
- C. Attendance Required: Job superintendent, major Subcontractors and suppliers, City of Fernandina Beach, Florida, Nassau County as library occupant, Architect, as appropriate to agenda topics for each meeting.
- D. Agenda:
 1. Review minutes of previous meetings.
 2. Review of Work progress.
 3. Field observations, problems, and decisions.
 4. Identification of problems that impede, or will impede, planned progress.
 5. Review of submittals schedule and status of submittals.
 6. Review of off-site fabrication and delivery schedules.
 7. Maintenance of progress schedule.
 8. Corrective measures to regain projected schedules.
 9. Planned progress during succeeding work period.
 10. Coordination of projected progress.
 11. Maintenance of quality and work standards.
 12. Effect of proposed changes on progress schedule and coordination.
 13. Other business relating to Work.
- E. Record minutes and distribute copies within two days after meeting to participants, with two copies to Architect, City of Fernandina Beach, Florida, participants, and those affected by decisions made.

3.04 CONSTRUCTION PROGRESS SCHEDULE

- A. Within 10 days after date of the Agreement, submit preliminary schedule defining planned operations for the first 60 days of Work, with a general outline for remainder of Work.

EXHIBIT "A"

- B. If preliminary schedule requires revision after review, submit revised schedule within 10 days.
- C. Within 20 days after review of preliminary schedule, submit draft of proposed complete schedule for review.
 - 1. Include written certification that major contractors have reviewed and accepted proposed schedule.
- D. Within 10 days after joint review, submit complete schedule.
- E. Submit updated schedule with each Application for Payment.

3.05 PROGRESS PHOTOGRAPHS

- A. Submit new photographs at least once a month, within 3 days after exposure.
- B. Photography Type: Digital; electronic files.
- C. Provide photographs of site and construction throughout progress of Work produced by an experienced photographer, acceptable to Architect.
- D. In addition to periodic, recurring views, take photographs of each of the following events:
 - 1. Completion of site clearing.
 - 2. Foundations in progress and upon completion.
 - 3. Structural framing in progress and upon completion.
 - 4. Enclosure of building, upon completion.
 - 5. Final completion, minimum of ten (10) photos.
- E. Take photographs as evidence of existing project conditions as follows:
 - 1. Interior views: 4.
 - 2. Exterior views: 4.
- F. Views:
 - 1. Consult with Architect for instructions on views required.
 - 2. Provide factual presentation.
 - 3. Provide correct exposure and focus, high resolution and sharpness, maximum depth of field, and minimum distortion.
- G. Digital Photographs: 24 bit color, minimum resolution of 1024 by 768, in JPG format; provide files unaltered by photo editing software.
 - 1. Delivery Medium: Via email with project record photo CD.
 - 2. File Naming: Include project identification, date and time of view, and view identification.
 - 3. PDF File: Assemble all photos into printable pages in PDF format, with 2 to 3 photos per page, each photo labeled with file name; one PDF file per submittal.
 - 4. Photo CD(s): Provide 1 copy including all photos cumulative to date and PDF file(s), with files organized in separate folders by submittal date.
- H. Deliver prints with each Application for Payment with transmittal letter specified in this Section.
- I. Deliver negatives or CD to City of Fernandina Beach, Florida with project record documents. Catalog and index negatives in chronological sequence; provide typed table of contents.

3.06 SUBMITTALS FOR REVIEW

- A. When the following are specified in individual sections, submit them for review:
 - 1. Product data.
 - 2. Shop drawings.
 - 3. Samples for selection.
 - 4. Samples for verification.
- B. Submit to Architect for review for the limited purpose of checking for conformance with information given and the design concept expressed in the contract documents.

- C. Samples will be reviewed only for aesthetic, color, or finish selection.
- D. After review, provide copies and distribute in accordance with SUBMITTAL PROCEDURES article below and for record documents purposes described in Section 01 78 00 - CLOSEOUT SUBMITTALS.

3.07 SUBMITTALS FOR INFORMATION

- A. When the following are specified in individual sections, submit them for information:
 - 1. Design data.
 - 2. FGBC Commercial Certification submittals applicable to work for which shop drawing or application being made.
 - 3. Certificates.
 - 4. Test reports.
 - 5. Inspection reports.
 - 6. Manufacturer's instructions.
 - 7. Manufacturer's field reports.
 - 8. Other types indicated.
- B. Submit for Architect's knowledge as contract administrator or for City of Fernandina Beach, Florida. No action will be taken.

3.08 SUBMITTALS FOR PROJECT CLOSEOUT

- A. When the following are specified in individual sections, submit them at project closeout:
 - 1. Project record documents.
 - 2. Operation and maintenance data.
 - 3. Warranties.
 - 4. Bonds.
 - 5. Additional Materials for Maintenance.
 - 6. Other types as indicated.
- B. Submit for City of Fernandina Beach, Florida's benefit during and after project completion.

3.09 NUMBER OF COPIES OF SUBMITTALS

- A. Documents for Review:
 - 1. Small Size Sheets, Not Larger Than 8-1/2 x 11 inches: Submit the number of copies that Contractor requires, plus three that will be retained by Architect.
 - 2. Larger Sheets, Not Larger Than 36 x 48 inches: Submit the number of opaque reproductions that Contractor requires, plus three that will be retained by Architect.
- B. Documents for Information: Submit three.
- C. Documents for Project Closeout: Make one reproduction of submittal originally reviewed. Submit one extra of submittals for information.
- D. Samples: Submit the number specified in individual specification sections; one of which will be retained by Architect.
 - 1. After review, produce duplicates.
 - 2. Retained samples will not be returned to Contractor unless specifically so stated.

3.10 SUBMITTAL PROCEDURES

- A. Transmit each submittal with approved form.
- B. Sequentially number the transmittal form. Revise submittals with original number and a sequential alphabetic suffix.
- C. Identify Project, Contractor, Subcontractor or supplier; pertinent drawing and detail number, and specification section number, as appropriate on each copy.

EXHIBIT "A"

- D. Apply Contractor's stamp, signed or initialed certifying that review, approval, 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. Deliver submittals to Architect at business address.
- F. Schedule submittals to expedite the Project, and coordinate submission of related items.
- G. For each submittal for review, allow 15 days excluding delivery time to and from the Contractor.
- H. Identify variations from Contract Documents and Product or system limitations that may be detrimental to successful performance of the completed Work.
- I. Provide space for Contractor and Architect review stamps.
- J. When revised for resubmission, identify all changes made since previous submission.
- K. Distribute reviewed submittals as appropriate. Instruct parties to promptly report any inability to comply with requirements.
- L. Submittals not requested will not be recognized or processed.

END OF SECTION

SECTION 01 40 00

QUALITY REQUIREMENTS

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. References and standards.
- B. Quality assurance submittals.
- C. Mock-ups.
- D. Control of installation.
- E. Tolerances.
- F. Testing and inspection services.
- G. Manufacturers' field services.

1.02 REFERENCE STANDARDS

- A. ASTM C1021 - Standard Practice for Laboratories Engaged in Testing of Building Sealants; 2008.
- B. ASTM C1077 - Standard Practice for Laboratories Testing Concrete and Concrete Aggregates for Use in Construction and Criteria for Laboratory Evaluation; 2011c.
- C. ASTM C1093 - Standard Practice for Accreditation of Testing Agencies for Masonry; 2012.
- D. ASTM D3740 - Standard Practice for Minimum Requirements for Agencies Engaged in the Testing and/or Inspection of Soil and Rock as Used in Engineering Design and Construction; 2012a.
- E. ASTM E329 - Standard Specification for Agencies Engaged Construction Inspection and/or Testing; 2011.
- F. ASTM E543 - Standard Specification for Agencies Performing Nondestructive Testing; 2009.
- G. ASTM E 548 - Standard Guide for General Criteria used for Evaluating Laboratory Competence; 1994.

1.03 SUBMITTALS

- A. Testing Agency Qualifications:
 - 1. Prior to start of Work, submit agency name, address, and telephone number, and names of full time registered Engineer and responsible officer.
- B. Design Data: Submit for Architect's knowledge as contract administrator for the limited purpose of assessing conformance with information given and the design concept expressed in the contract documents, or for City of Fernandina Beach, Florida's information.
- C. Test Reports: After each test/inspection, promptly submit two copies of report to Architect and to Contractor.
- D. Certificates: When specified in individual specification sections, submit certification by the manufacturer and Contractor or installation/application subcontractor to Architect, in quantities specified for Product Data.
 - 1. Indicate material or product conforms to or exceeds specified requirements. Submit supporting reference data, affidavits, and certifications as appropriate.
 - 2. Certificates may be recent or previous test results on material or product, but must be

acceptable to Architect.

- E. Manufacturer's Instructions: When specified in individual specification sections, submit printed instructions for delivery, storage, assembly, installation, start-up, adjusting, and finishing, for the City of Fernandina Beach, Florida's information. Indicate special procedures, perimeter conditions requiring special attention, and special environmental criteria required for application or installation.
- F. Erection Drawings: Submit drawings for Architect's benefit as contract administrator or for City of Fernandina Beach, Florida.
 - 1. Submit for information for the limited purpose of assessing conformance with information given and the design concept expressed in the contract documents.

1.04 TESTING AND INSPECTION AGENCIES

- A. Contractor shall provide complete testing and balancing of HVAC systems by an independent agency and submit a completed and certified Test and Balance Report. Owner, at their expense, may provide additional independent testing and balancing for monitoring and verification purposes of the Contractor's submitted Test and Balance Report and compliance with the Contract documents. The Contractor shall make all corrections of deficiencies noted by either or both reports prior to final acceptance of the Project.
- B. Contractor shall employ and pay for services of an independent testing agency to perform other specified testing.
- C. Employment of agency in no way relieves Contractor of obligation to perform Work in accordance with requirements of Contract Documents.
- D. Contractor Employed Agency:
 - 1. Testing agency: Comply with requirements of ASTM E329, ASTM E543, ASTM C1021, ASTM C1077, and ASTM C1093.
 - 2. Inspection agency: Comply with requirements of ASTM D3740 and ASTM E329.
 - 3. Laboratory: Authorized to operate in State in which Project is located.
 - 4. Laboratory Staff: Maintain a full time registered Engineer on staff to review services.
 - 5. Testing Equipment: Calibrated at reasonable intervals either by NIST or using an NIST established Measurement Assurance Program, under a laboratory measurement quality assurance program.

PART 2 PRODUCTS - NOT USED

PART 3 EXECUTION

3.01 CONTROL OF INSTALLATION

- A. Monitor quality control over suppliers, manufacturers, products, services, site conditions, and workmanship, to produce Work of specified quality.
- B. Comply with manufacturers' instructions, including each step in sequence.
- C. Should manufacturers' instructions conflict with Contract Documents, request clarification from Architect before proceeding.
- D. Comply with specified standards as minimum quality for the Work except where more stringent tolerances, codes, or specified requirements indicate higher standards or more precise workmanship.
- E. Have Work performed by persons qualified to produce required and specified quality.
- F. Verify that field measurements are as indicated on shop drawings or as instructed by the manufacturer.

- G. Secure products in place with positive anchorage devices designed and sized to withstand stresses, vibration, physical distortion, and disfigurement.

3.02 MOCK-UPS

- A. Tests will be performed under provisions identified in this section and identified in the respective product specification sections.
- B. Assemble and erect specified items with specified attachment and anchorage devices, flashings, seals, and finishes.
- C. Accepted mock-ups shall be a comparison standard for the remaining Work.
- D. Where mock-up has been accepted by Architect and is specified in product specification sections to be removed, remove mock-up and clear area when directed to do so.

3.03 TOLERANCES

- A. Monitor fabrication and installation tolerance control of products to produce acceptable Work. Do not permit tolerances to accumulate.
- B. Comply with manufacturers' tolerances. Should manufacturers' tolerances conflict with Contract Documents, request clarification from Architect before proceeding.
- C. Adjust products to appropriate dimensions; position before securing products in place.

3.04 TESTING AND INSPECTION

- A. Testing Agency Duties:
 1. Provide qualified personnel at site. Cooperate with Architect and Contractor in performance of services.
 2. Perform specified sampling and testing of products in accordance with specified standards.
 3. Ascertain compliance of materials and mixes with requirements of Contract Documents.
 4. Promptly notify Architect and Contractor of observed irregularities or non-conformance of Work or products.
 5. Perform additional tests and inspections required by Architect.
 6. Submit reports of all tests/inspections specified.
- B. Limits on Testing/Inspection Agency Authority:
 1. Agency may not release, revoke, alter, or enlarge on requirements of Contract Documents.
 2. Agency may not approve or accept any portion of the Work.
 3. Agency may not assume any duties of Contractor.
 4. Agency has no authority to stop the Work.
- C. Contractor Responsibilities:
 1. Deliver to agency at designated location, adequate samples of materials proposed to be used that require testing, along with proposed mix designs.
 2. Cooperate with laboratory personnel, and provide access to the Work and to manufacturers' facilities.
 3. Provide incidental labor and facilities:
 - a. To provide access to Work to be tested/inspected.
 - b. To obtain and handle samples at the site or at source of Products to be tested/inspected.
 - c. To facilitate tests/inspections.
 - d. To provide storage and curing of test samples.
 4. Notify Architect and laboratory 24 hours prior to expected time for operations requiring testing/inspection services.
 5. Employ services of an independent qualified testing laboratory and pay for additional samples, tests, and inspections required by Contractor beyond specified requirements.

- 6. Arrange with City of Fernandina Beach, Florida's agency and pay for additional samples, tests, and inspections required by Contractor beyond specified requirements.
- D. Re-testing required because of non-conformance to specified requirements shall be performed by the same agency on instructions by Architect.
- E. Re-testing required because of non-conformance to specified requirements shall be paid for by Contractor.
- F. Re-testing required because of non-conformance to specified requirements shall be performed by the same agency on instructions by Architect. Payment for re testing will be charged to the Contractor by deducting testing charges from the Contract Price.

3.05 MANUFACTURERS' FIELD SERVICES

- A. When specified in individual specification sections, require material or product suppliers or manufacturers to provide qualified staff personnel to observe site conditions, conditions of surfaces and installation, quality of workmanship, start-up of equipment, test, adjust and balance of equipment and as applicable, and to initiate instructions when necessary.
- B. Submit qualifications of observer to Architect 30 days in advance of required observations.
 - 1. Observer subject to approval of Architect.
 - 2. Observer subject to approval of City of Fernandina Beach, Florida.
- C. Report observations and site decisions or instructions given to applicators or installers that are supplemental or contrary to manufacturers' written instructions.

3.06 DEFECT ASSESSMENT

- A. Replace Work or portions of the Work not conforming to specified requirements.
- B. If, in the opinion of Architect, it is not practical to remove and replace the Work, Architect will direct an appropriate remedy or adjust payment.

END OF SECTION

SECTION 01 50 00

TEMPORARY FACILITIES AND CONTROLS

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Temporary utilities.
- B. Temporary telecommunications services.
- C. Temporary telephone service.
- D. Temporary sanitary facilities.
- E. Temporary Controls: Barriers, enclosures, and fencing.
- F. Security requirements.
- G. Vehicular access and parking.
- H. Waste removal facilities and services.
- I. Project identification sign.
- J. Field offices.

1.02 TEMPORARY UTILITIES

- A. Provide and pay for all electrical power, lighting, heating and cooling, and ventilation required for construction purposes.
- B. Existing facilities may not be used.
- C. New permanent facilities may not be used.
- D. Use trigger-operated nozzles for water hoses, to avoid waste of water.

1.03 TELECOMMUNICATIONS SERVICES

- A. Provide, maintain, and pay for telecommunications services to field office at time of project mobilization.

1.04 TEMPORARY SANITARY FACILITIES

- A. Provide and maintain required facilities and enclosures. Provide at time of project mobilization.
- B. Use of existing facilities is not permitted.
- C. Maintain daily in clean and sanitary condition.

1.05 BARRIERS

- A. Provide barriers to prevent unauthorized entry to construction areas, to prevent access to areas that could be hazardous to workers or the public, to allow for owner's use of site and to protect existing facilities and adjacent properties from damage from construction operations and demolition.
- B. Provide barricades and covered walkways required by governing authorities for public rights-of-way and for public access to existing building.
- C. Provide protection for plants designated to remain. Replace damaged plants.
- D. Protect non-owned vehicular traffic, stored materials, site, and structures from damage.

EXHIBIT "A"

1.06 FENCING

- A. Construction: Commercial grade chain link fence.
- B. Provide 6 foot high fence around construction site; equip with vehicular and pedestrian gates with locks.

1.07 EXTERIOR ENCLOSURES

- A. Provide temporary weather tight closure of exterior openings to accommodate acceptable working conditions and protection for Products, to allow for temporary heating and maintenance of required ambient temperatures identified in individual specification sections, and to prevent entry of unauthorized persons. Provide access doors with self-closing hardware and locks.
- B. Provide temporary roofing as specified in Section 07 52 00.

1.08 INTERIOR ENCLOSURES

- A. Provide temporary partitions and ceilings as indicated to separate work areas from City of Fernandina Beach, Florida-Nassau County as library occupied areas, to prevent penetration of dust and moisture into City of Fernandina Beach, Florida-occupied areas, and to prevent damage to existing materials and equipment.
- B. Construction: Framing and reinforced polyethylene sheet materials with closed joints and sealed edges at intersections with existing surfaces:
 - 1. Insulated to R 20.
 - 2. STC rating of 35 in accordance with ASTM E90.
 - 3. Maximum flame spread rating of 75 in accordance with ASTM E84.
- C. Paint interior surfaces exposed to view from City of Fernandina Beach, Florida-occupied areas.

1.09 SECURITY

- A. Provide security and facilities to protect Work, existing facilities, and City of Fernandina Beach, Florida's operations from unauthorized entry, vandalism, or theft.
- B. Coordinate with City of Fernandina Beach, Florida's security program.

1.10 VEHICULAR ACCESS AND PARKING

- A. Coordinate access and haul routes with governing authorities and City of Fernandina Beach, Florida.
- B. Provide and maintain access to fire hydrants, free of obstructions.
- C. Provide means of removing mud from vehicle wheels before entering streets.
- D. Designated existing on-site roads may be used for construction traffic.
- E. Provide temporary parking areas to accommodate construction personnel. When site space is not adequate, provide additional off-site parking.
- F. Existing parking areas located at contractor's mobilization area may be used for construction parking.
- G. Do not allow vehicle parking on existing pavement.
- H. Contract deliveries or Construction vehicles shall not obstruct library operational access or traffic patterns.

1.11 WASTE REMOVAL

- A. See Section 01 74 19 - Waste Management, for additional requirements.

- B. Provide waste removal facilities and services as required to maintain the site in clean and orderly condition.
- C. Provide containers with lids. Remove trash from site periodically.
- D. If materials to be recycled or re-used on the project must be stored on-site, provide suitable non-combustible containers; locate containers holding flammable material outside the structure unless otherwise approved by the authorities having jurisdiction.
- E. Open free-fall chutes are not permitted. Terminate closed chutes into appropriate containers with lids.

1.12 PROJECT IDENTIFICATION

- A. Provide project identification sign of design and construction indicated on Drawings.
- B. Erect on site at location established by Architect.
- C. No other signs are allowed without City of Fernandina Beach, Florida permission except those required by law.

1.13 FIELD OFFICES

- A. Office: Weathertight, with lighting, electrical outlets, heating, cooling equipment, and equipped with sturdy furniture, drawing rack and drawing display table.
- B. Provide space for Project meetings, with table and chairs to accommodate 6 persons.
- C. Locate offices a minimum distance of 30 feet from existing and new structures.

1.14 REMOVAL OF UTILITIES, FACILITIES, AND CONTROLS

- A. Remove temporary utilities, equipment, facilities, materials, prior to Substantial Completion inspection.
- B. Remove underground installations to a minimum depth of 2 feet. Grade site as indicated.
- C. Clean and repair damage caused by installation or use of temporary work.
- D. Restore existing facilities used during construction to original condition.

END OF SECTION

SECTION 01 60 00

PRODUCT REQUIREMENTS

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. General product requirements.
- B. FGBC Commercial Certification related product requirements.
- C. Re-use of existing products.
- D. Transportation, handling, storage and protection.
- E. Product option requirements.
- F. Substitution limitations and procedures.
- G. Procedures for City of Fernandina Beach, Florida-supplied products.
- H. Maintenance materials, including extra materials, spare parts, tools, and software.

1.02 REFERENCE STANDARDS

- A. NFPA 70 - National Electrical Code; National Fire Protection Association; Most Recent Edition Adopted by Authority Having Jurisdiction, Including All Applicable Amendments and Supplements.

1.03 SUBMITTALS

- A. Product Data Submittals: Submit manufacturer's standard published data. Mark each copy to identify applicable products, models, options, and other data. Supplement manufacturers' standard data to provide information specific to this Project.
- B. Shop Drawing Submittals: Prepared specifically for this Project; indicate utility and electrical characteristics, utility connection requirements, and location of utility outlets for service for functional equipment and appliances.
- C. Sample Submittals: Illustrate functional and aesthetic characteristics of the product, with integral parts and attachment devices. Coordinate sample submittals for interfacing work.
 - 1. For selection from standard finishes, submit samples of the full range of the manufacturer's standard colors, textures, and patterns.
- D. FGBC Submittals: FGBC Commercial Certification submittals applicable to work for which shop drawing or application being made. Provide information in Shop Drawing Submittals as required by specifications. Other documentation or certification is not required.
- E. Indicate utility and electrical characteristics, utility connection requirements, and location of utility outlets for service for functional equipment and appliances.

PART 2 PRODUCTS

2.01 EXISTING PRODUCTS

- A. The re-use of certain materials and equipment already existing on the project site is required.
 - 1. Do not use other materials or equipment removed from existing premises unless specifically required or permitted by the Contract Documents.
- B. Unforeseen historic items encountered remain the property of the City of Fernandina Beach, Florida; notify City of Fernandina Beach, Florida promptly upon discovery; protect, remove, handle, and store as directed by City of Fernandina Beach, Florida.

- C. Existing materials and equipment indicated to be removed, but not to be re-used, relocated, reinstalled, delivered to the City of Fernandina Beach, Florida, or otherwise indicated as to remain the property of the City of Fernandina Beach, Florida, become the property of the Contractor; remove from site.

2.02 NEW PRODUCTS

- A. Provide new products unless specifically required or permitted by the Contract Documents.
- B. Regionally-Sourced Products:
 - 1. Overall Project Requirement: Provide materials amounting to a minimum of 5 to 20 percent of the total value of all materials (excluding plumbing, HVAC, electrical, and other equipment) that have been extracted, harvested, or recovered, as well as manufactured, within a radius of 700 miles from the project site.
- C. Products with Recycled or Recyclable Content:
 - 1. Overall Project Requirement: Provide products with recycled content, or which can be recycled in the future, such that the sum of post-consumer recycled content plus one-half of the post-industrial recycled content constitutes at least 10 percent of the total value of all products installed, except mechanical and electrical components.

2.03 PRODUCT OPTIONS

- A. Products Specified by Reference Standards or by Description Only: Use any product meeting those standards or description.
- B. Products Specified by Naming One or More Manufacturers: Use a product of one of the manufacturers named and meeting specifications, no options or substitutions allowed.
- C. Products Specified by Naming One or More Manufacturers with a Provision for Substitutions: Submit a request for substitution for any manufacturer not named.

2.04 MAINTENANCE MATERIALS

- A. Furnish extra materials, spare parts, tools, and software of types and in quantities specified in individual specification sections.
- B. Deliver to The City of Fernandina Beach; obtain receipt prior to final payment.

PART 3 EXECUTION

3.01 SUBSTITUTION PROCEDURES

- A. Instructions to Bidders specify time restrictions for submitting requests for substitutions during the bidding period. Comply with requirements specified in this section.
- B. Substitutions may be considered when a product becomes unavailable through no fault of the Contractor.
- C. Document each request with complete data substantiating compliance of proposed substitution with Contract Documents.
- D. A request for substitution constitutes a representation that the submitter:
 - 1. Has investigated proposed product and determined that it meets or exceeds the quality level of the specified product.
 - 2. Will provide the same warranty for the substitution as for the specified product.
 - 3. Will coordinate installation and make changes to other Work that may be required for the Work to be complete with no additional cost to City of Fernandina Beach, Florida.
 - 4. Waives claims for additional costs or time extension that may subsequently become apparent.

- E. Substitutions will not be considered when they are indicated or implied on shop drawing or product data submittals, without separate written request, or when acceptance will require revision to the Contract Documents.
- F. Substitution Submittal Procedure:
 - 1. Submit three copies of request for substitution for consideration. Limit each request to one proposed substitution.
 - 2. Submit shop drawings, product data, and certified test results attesting to the proposed product equivalence. Burden of proof is on proposer.
 - 3. The Architect will notify Contractor in writing of decision to accept or reject request.

3.02 TRANSPORTATION AND HANDLING

- A. Coordinate schedule of product delivery to designated prepared areas in order to minimize site storage time and potential damage to stored materials.
- B. Transport and handle products in accordance with manufacturer's instructions.
- C. Transport materials in covered trucks to prevent contamination of product and littering of surrounding areas.
- D. Promptly inspect shipments to ensure that products comply with requirements, quantities are correct, and products are undamaged.
- E. Provide equipment and personnel to handle products by methods to prevent soiling, disfigurement, or damage.
- F. Arrange for the return of packing materials, such as wood pallets, where economically feasible.

3.03 STORAGE AND PROTECTION

- A. Designate receiving/storage areas for incoming products so that they are delivered according to installation schedule and placed convenient to work area in order to minimize waste due to excessive materials handling and misapplication.
- B. Store and protect products in accordance with manufacturers' instructions.
- C. Store with seals and labels intact and legible.
- D. Store sensitive products in weather tight, climate controlled, enclosures in an environment favorable to product.
- E. For exterior storage of fabricated products, place on sloped supports above ground.
- F. Provide bonded off-site storage and protection when site does not permit on-site storage or protection.
- G. Cover products subject to deterioration with impervious sheet covering. Provide ventilation to prevent condensation and degradation of products.
- H. Store loose granular materials on solid flat surfaces in a well-drained area. Prevent mixing with foreign matter.
- I. Prevent contact with material that may cause corrosion, discoloration, or staining.
- J. Provide equipment and personnel to store products by methods to prevent soiling, disfigurement, or damage.
- K. Arrange storage of products to permit access for inspection. Periodically inspect to verify products are undamaged and are maintained in acceptable condition.

END OF SECTION

SECTION 01 70 00

EXECUTION AND CLOSEOUT REQUIREMENTS

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Examination, preparation, and general installation procedures.
- B. Requirements for alterations work, including selective demolition, except removal, disposal, and/or remediation of hazardous materials and toxic substances.
- C. Pre-installation meetings.
- D. Cutting and patching.
- E. Surveying for laying out the work.
- F. Cleaning and protection.
- G. Starting of systems and equipment.
- H. Demonstration and instruction of City of Fernandina Beach, Florida personnel.
- I. Closeout procedures, except payment procedures.
- J. General requirements for maintenance service.

1.02 REFERENCE STANDARDS

- A. NFPA 241 - Standard for Safeguarding Construction, Alteration, and Demolition Operations; 2009.

1.03 SUBMITTALS

- A. See Section 01 30 00 - Administrative Requirements, for submittal procedures.
- B. Survey work: Submit name, address, and telephone number of Surveyor before starting survey work:
 - 1. On request, submit documentation verifying accuracy of survey work.
 - 2. Submit a copy of site drawing signed by the Land Surveyor, that the elevations and locations of the work are in conformance with Contract Documents.
 - 3. Submit surveys and survey logs for the project record.
- C. Demolition Plan: Submit demolition plan as specified by OSHA and local authorities.
 - 1. Indicate extent of demolition, removal sequence, bracing and shoring, and location and construction of barricades and fences. Include design drawings and calculations for bracing and shoring.
 - 2. Identify demolition firm and submit qualifications.
 - 3. Include a summary of safety procedures.
- D. Cutting and Patching: Submit written request in advance of cutting or alteration that affects:
 - 1. Structural integrity of any element of Project.
 - 2. Integrity of weather exposed or moisture resistant element.
 - 3. Efficiency, maintenance, or safety of any operational element.
 - 4. Visual qualities of sight exposed elements.
 - 5. Work of City of Fernandina Beach, Florida or separate Contractor.
- E. Project Record Documents: Accurately record actual locations of capped and active utilities.

1.04 QUALIFICATIONS

EXHIBIT "A"

- A. For demolition work, employ a firm specializing in the type of work required.
- B. For survey work, employ a land surveyor registered in Florida, and acceptable to Architect. Submit evidence of Surveyor's Errors and Omissions insurance coverage in the form of an Insurance Certificate.
- C. For field engineering, employ a professional engineer of the discipline required for specific service on Project, licensed in The State of Florida.
- D. For design of temporary shoring and bracing, employ a Professional Engineer experienced in design of this type of work and licensed in Florida.

1.05 PROJECT CONDITIONS

- A. Use of explosives is not permitted.
- B. Grade site to drain. Maintain excavations free of water. Provide, operate, and maintain pumping equipment.
- C. Protect site from puddling or running water. Provide water barriers as required to protect site from soil erosion.
- D. Ventilate enclosed areas to assist cure of materials, to dissipate humidity, and to prevent accumulation of dust, fumes, vapors, or gases.
- E. Dust Control: Execute work by methods to minimize raising dust from construction operations. Provide positive means to prevent air-borne dust from dispersing into atmosphere and over adjacent property.
 - 1. Provide dust-proof barriers between construction areas and areas continuing to be occupied by City of Fernandina Beach, Florida.
- F. Erosion and Sediment Control: Plan and execute work by methods to control surface drainage from cuts and fills, from borrow and waste disposal areas. Prevent erosion and sedimentation.
- G. Noise Control: Provide methods, means, and facilities to minimize noise produced by construction operations.
 - 1. At All Times: Excessively noisy tools and operations will not be tolerated inside the building at any library operation time of day; excessively noisy includes jackhammers.
- H. Pest and Rodent Control: Provide methods, means, and facilities to prevent pests and insects from damaging the work.
- I. Rodent Control: Provide methods, means, and facilities to prevent rodents from accessing or invading premises.
- J. Pollution Control: Provide methods, means, and facilities to prevent contamination of soil, water, and atmosphere from discharge of noxious, toxic substances, and pollutants produced by construction operations. Comply with federal, state, and local regulations.

1.06 COORDINATION

- A. See Section 01 10 00 for occupancy-related requirements.
- B. Coordinate scheduling, submittals, and work of the various sections of the Project Manual to ensure efficient and orderly sequence of installation of interdependent construction elements, with provisions for accommodating items installed later.
- C. Notify affected utility companies and comply with their requirements.
- D. Verify that utility requirements and characteristics of new operating equipment are compatible with building utilities. Coordinate work of various sections having interdependent responsibilities for installing, connecting to, and placing in service, such equipment.

- E. Coordinate space requirements, supports, and installation of mechanical and electrical work that are indicated diagrammatically on Drawings. Follow routing shown for pipes, ducts, and conduit, as closely as practicable; place runs parallel with lines of building. Utilize spaces efficiently to maximize accessibility for other installations, for maintenance, and for repairs.
- F. In finished areas except as otherwise indicated, conceal pipes, ducts, and wiring within the construction. Coordinate locations of fixtures and outlets with finish elements.
- G. Coordinate completion and clean-up of work of separate sections.
- H. After City of Fernandina Beach, Florida occupancy of each Phase of work on the premises, coordinate access to site for correction of defective work and work not in accordance with Contract Documents, to minimize disruption of City of Fernandina Beach, Florida's activities.

PART 2 PRODUCTS

2.01 PATCHING MATERIALS

- A. **New Materials:** As specified in product sections; match existing products and work for patching and extending work.
- B. **Type and Quality of Existing Products:** Determine by inspecting and testing products where necessary, referring to existing work as a standard.
- C. **Product Substitution:** For any proposed change in materials, submit request for substitution described in Section 01 60 00.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Verify that existing site conditions and substrate surfaces are acceptable for subsequent work. Start of work means acceptance of existing conditions.
- B. Verify that existing substrate is capable of structural support or attachment of new work being applied or attached.
- C. Examine and verify specific conditions described in individual specification sections.
- D. Take field measurements before confirming product orders or beginning fabrication, to minimize waste due to over-ordering or misfabrication.
- E. Verify that utility services are available, of the correct characteristics, and in the correct locations.
- F. **Prior to Cutting:** Examine existing conditions prior to commencing work, including elements subject to damage or movement during cutting and patching. After uncovering existing work, assess conditions affecting performance of work. Beginning of cutting or patching means acceptance of existing conditions.

3.02 PREPARATION

- A. Clean substrate surfaces prior to applying next material or substance.
- B. Seal cracks or openings of substrate prior to applying next material or substance.
- C. Apply manufacturer required or recommended substrate primer, sealer, or conditioner prior to applying any new material or substance in contact or bond.

3.03 PREINSTALLATION MEETINGS

- A. When required in individual specification sections, convene a preinstallation meeting at the site prior to commencing work of the section.

- B. Require attendance of parties directly affecting, or affected by, work of the specific section.
- C. Notify Architect four days in advance of meeting date.
- D. Prepare agenda and preside at meeting:
 1. Review conditions of examination, preparation and installation procedures.
 2. Review coordination with related work.
- E. Record minutes and distribute copies within two days after meeting to participants, with two copies to Architect, City of Fernandina Beach, Florida, participants, and those affected by decisions made.

3.04 LAYING OUT THE WORK

- A. Verify locations of survey control points prior to starting work.
- B. Promptly notify Architect of any discrepancies discovered.
- C. Contractor shall locate and protect survey control and reference points.
- D. Protect survey control points prior to starting site work; preserve permanent reference points during construction.
- E. Promptly report to Architect the loss or destruction of any reference point or relocation required because of changes in grades or other reasons.
- F. Replace dislocated survey control points based on original survey control. Make no changes without prior written notice to Architect.
- G. Utilize recognized engineering survey practices.
- H. Establish elevations, lines and levels. Locate and lay out by instrumentation and similar appropriate means:
 1. Site improvements including pavements; stakes for grading, fill and topsoil placement; utility locations, slopes, and invert elevations.
 2. Grid or axis for structures.
 3. Building foundation, column locations, ground floor elevations.
- I. Periodically verify layouts by same means.
- J. Maintain a complete and accurate log of control and survey work as it progresses.
- K. On completion of foundation walls and major site improvements, prepare a certified survey illustrating dimensions, locations, angles, and elevations of construction and site work.

3.05 GENERAL INSTALLATION REQUIREMENTS

- A. In addition to compliance with regulatory requirements, conduct construction operations in compliance with NFPA 241, including applicable recommendations in Appendix A.
- B. Install products as specified in individual sections, in accordance with manufacturer's instructions and recommendations, and so as to avoid waste due to necessity for replacement.
- C. Make vertical elements plumb and horizontal elements level, unless otherwise indicated.
- D. Install equipment and fittings plumb and level, neatly aligned with adjacent vertical and horizontal lines, unless otherwise indicated.
- E. Make consistent texture on surfaces, with seamless transitions, unless otherwise indicated.
- F. Make neat transitions between different surfaces, maintaining texture and appearance.

3.06 ALTERATIONS

EXHIBIT "A"

- A. Drawings showing existing construction and utilities are based on casual field observation and existing record documents only.
 - 1. Verify that construction and utility arrangements are as shown.
 - 2. Report discrepancies to Architect before disturbing existing installation.
 - 3. Beginning of alterations work constitutes acceptance of existing conditions.
- B. Keep areas in which alterations are being conducted separated from other areas that are still occupied.
 - 1. Provide, erect, and maintain temporary dustproof partitions of construction specified in Section 01 50 00 in locations indicated on drawings.
 - 2. Provide sound retardant partitions of construction indicated on drawings in locations indicated on drawings.
- C. Maintain weatherproof exterior building enclosure except for interruptions required for replacement or modifications; take care to prevent water and humidity damage.
 - 1. Where openings in exterior enclosure exist, provide construction to make exterior enclosure weatherproof.
 - 2. Insulate existing ducts or pipes that are exposed to outdoor ambient temperatures by alterations work.
- D. Remove existing work as indicated and as required to accomplish new work.
 - 1. Remove rotted wood, corroded metals, and deteriorated masonry and concrete; replace with new construction specified.
 - 2. Remove items indicated on drawings.
 - 3. Relocate items indicated on drawings.
 - 4. Where new surface finishes are to be applied to existing work, perform removals, patch, and prepare existing surfaces as required to receive new finish; remove existing finish if necessary for successful application of new finish.
 - 5. Where new surface finishes are not specified or indicated, patch holes and damaged surfaces to match adjacent finished surfaces as closely as possible.
- E. Services (Including but not limited to HVAC, Plumbing, Fire Protection, Electrical, and Telecommunications): Remove, relocate, and extend existing systems to accommodate new construction.
 - 1. Maintain existing active systems that are to remain in operation; maintain access to equipment and operational components; if necessary, modify installation to allow access or provide access panel.
 - 2. Where existing systems or equipment are not active and Contract Documents require reactivation, put back into operational condition; repair supply, distribution, and equipment as required.
 - 3. Where existing active systems serve occupied facilities but are to be replaced with new services, maintain existing systems in service until new systems are complete and ready for service.
 - a. Disable existing systems only to make switchovers and connections; minimize duration of outages.
 - b. Provide temporary connections as required to maintain existing systems in service.
 - 4. Verify that abandoned services serve only abandoned facilities.
 - 5. Remove abandoned pipe, ducts, conduits, and equipment, including those above accessible ceilings; remove back to source of supply where possible, otherwise cap stub and tag with identification; patch holes left by removal using materials specified for new construction.
- F. Protect existing work to remain.
 - 1. Prevent movement of structure; provide shoring and bracing if necessary.
 - 2. Perform cutting to accomplish removals neatly and as specified for cutting new work.
 - 3. Repair adjacent construction and finishes damaged during removal work.

4. Patch as specified for patching new work.
- G. Adapt existing work to fit new work: Make as neat and smooth transition as possible.
1. When existing finished surfaces are cut so that a smooth transition with new work is not possible, terminate existing surface along a straight line at a natural line of division and make recommendation to Architect.
 2. Where removal of partitions or walls results in adjacent spaces becoming one, rework floors, walls, and ceilings to a smooth plane without breaks, steps, or bulkheads.
 3. Where a change of plane of 1/4 inch or more occurs in existing work, submit recommendation for providing a smooth transition for Architect review and request instructions.
 4. Trim existing wood doors as necessary to clear new floor finish. Refinish trim as required.
- H. Patching: Where the existing surface is not indicated to be refinished, patch to match the surface finish that existed prior to cutting. Where the surface is indicated to be refinished, patch so that the substrate is ready for the new finish.
- I. Refinish existing surfaces as indicated:
1. Where rooms or spaces are indicated to be refinished, refinish all visible existing surfaces to remain to the specified condition for each material, with a neat transition to adjacent finishes.
 2. If mechanical or electrical work is exposed accidentally during the work, re-cover and refinish to match.
 3. Patch as specified for patching new work.
- J. Clean existing systems and equipment.
- K. Remove demolition debris and abandoned items from alterations areas and dispose of off-site; do not burn or bury.
- L. Do not begin new construction in alterations areas before demolition is complete.
- M. Comply with all other applicable requirements of this section.

3.07 CUTTING AND PATCHING

- A. Whenever possible, execute the work by methods that avoid cutting or patching.
- B. See Alterations article above for additional requirements.
- C. Perform whatever cutting and patching is necessary to:
1. Complete the work.
 2. Fit products together to integrate with other work.
 3. Provide openings for penetration of mechanical, electrical, and other services.
 4. Match work that has been cut to adjacent work.
 5. Repair areas adjacent to cuts to required condition.
 6. Repair new work damaged by subsequent work.
 7. Remove samples of installed work for testing when requested.
 8. Remove and replace defective and non-conforming work.
- D. Execute cutting and patching including excavation and fill to complete the work, to uncover work in order to install improperly sequenced work, to remove and replace defective or non-conforming work, to remove samples of installed work for testing when requested, to provide openings in the work for penetration of mechanical and electrical work, to execute patching to complement adjacent work, and to fit products together to integrate with other work.
- E. Execute work by methods that avoid damage to other work and that will provide appropriate surfaces to receive patching and finishing. In existing work, minimize damage and restore to original condition.

- F. Employ original installer to perform cutting for weather exposed and moisture resistant elements, and sight exposed surfaces.
- G. Cut rigid materials using masonry saw or core drill. Pneumatic tools not allowed without prior approval.
- H. Restore work with new products in accordance with requirements of Contract Documents.
- I. Fit work air tight to pipes, sleeves, ducts, conduit, and other penetrations through surfaces.
- J. At penetrations of fire rated walls, partitions, ceiling, or floor construction, completely seal voids with fire rated material in accordance with Section 07 84 00, to full thickness of the penetrated element. All penetrations through fire rated construction shall be fire stopped as per NEC 300-21 using a through penetration fire stop system (XHEZ) listed in the Underwriter Laboratory Fire Resistance Directory.
- K. Patching:
 - 1. Finish patched surfaces to match finish that existed prior to patching. On continuous surfaces, refinish to nearest intersection or natural break. For an assembly, refinish entire unit.
 - 2. Match color, texture, and appearance.
 - 3. Repair patched surfaces that are damaged, lifted, discolored, or showing other imperfections due to patching work. If defects are due to condition of substrate, repair substrate prior to repairing finish.
- L. Refinish surfaces to match adjacent finish. For continuous surfaces, refinish to nearest intersection or natural break. For an assembly, refinish entire unit.
- M. Make neat transitions. Patch work to match adjacent work in texture and appearance. Where new work abuts or aligns with existing, perform a smooth and even transition.
- N. Patch or replace surfaces that are damaged, lifted, discolored, or showing other imperfections due to patching work. Repair substrate prior to patching finish. Finish patches to produce uniform finish and texture over entire area. When finish cannot be matched, refinish entire surface to nearest intersections.

3.08 PROGRESS CLEANING

- A. Maintain areas free of waste materials, debris, and rubbish. Maintain site in a clean and orderly condition.
- B. Remove debris and rubbish from pipe chases, plenums, attics, crawl spaces, and other closed or remote spaces, prior to enclosing the space.
- C. Broom and vacuum clean interior areas prior to start of surface finishing, and continue cleaning to eliminate dust.
- D. Collect and remove waste materials, debris, and trash/rubbish from site periodically and dispose off-site; do not burn or bury.

3.09 PROTECTION OF INSTALLED WORK

- A. Protect installed work from damage by construction operations.
- B. Provide special protection where specified in individual specification sections.
- C. Provide temporary and removable protection for installed products. Control activity in immediate work area to prevent damage.
- D. Provide protective coverings at walls, projections, jambs, sills, and soffits of openings.
- E. Protect finished floors, stairs, and other surfaces from traffic, dirt, wear, damage, or movement of

heavy objects, by protecting with durable sheet materials.

- F. Prohibit traffic or storage upon waterproofed or roofed surfaces. If traffic or activity is necessary, obtain recommendations for protection from waterproofing or roofing material manufacturer.
- G. Remove protective coverings when no longer needed; reuse or recycle plastic coverings if possible.

3.10 SYSTEM STARTUP

- A. Coordinate schedule for start-up of various equipment and systems.
- B. Verify that each piece of equipment or system has been checked for proper lubrication, drive rotation, belt tension, control sequence, and for conditions that may cause damage.
- C. Verify tests, meter readings, and specified electrical characteristics agree with those required by the equipment or system manufacturer.
- D. Verify that wiring and support components for equipment are complete and tested.
- E. Execute start-up under supervision of applicable Contractor personnel and manufacturer's representative in accordance with manufacturers' instructions.
- F. When specified in individual specification Sections, require manufacturer to provide authorized representative to be present at site to inspect, check, and approve equipment or system installation prior to start-up, and to supervise placing equipment or system in operation.
- G. Submit a written report that equipment or system has been properly installed and is functioning correctly.

3.11 DEMONSTRATION AND INSTRUCTION

- A. Demonstrate operation and maintenance of products to City of Fernandina Beach, Florida's personnel two weeks prior to date of Substantial Completion.
- B. Demonstrate start-up, operation, control, adjustment, trouble-shooting, servicing, maintenance, and shutdown of each item of equipment at scheduled time, at equipment location.
- C. For equipment or systems requiring seasonal operation, perform demonstration for other season within six months.
- D. Provide a qualified person who is knowledgeable about the Project to perform demonstration and instruction of owner personnel.
- E. Perform instruction in a classroom environment located at school.
- F. Utilize operation and maintenance manuals as basis for instruction. Review contents of manual with City of Fernandina Beach, Florida's personnel in detail to explain all aspects of operation and maintenance.
- G. Prepare and insert additional data in operations and maintenance manuals when need for additional data becomes apparent during instruction.
- H. The amount of time required for instruction on each item of equipment and system is that specified in individual sections.

3.12 ADJUSTING

- A. Adjust operating products and equipment to ensure smooth and unhindered operation.

3.13 FINAL CLEANING

- A. Execute final cleaning prior to final project assessment.
 1. Clean areas to be occupied by City of Fernandina Beach, Florida prior to final completion

before City of Fernandina Beach, Florida occupancy.

- B. Use cleaning materials that are nonhazardous.
- C. Clean interior and exterior glass, surfaces exposed to view; remove temporary labels, stains and foreign substances, polish transparent and glossy surfaces, vacuum carpeted and soft surfaces.
- D. Remove all labels that are not permanent. Do not paint or otherwise cover fire test labels or nameplates on mechanical and electrical equipment.
- E. Clean equipment and fixtures to a sanitary condition with cleaning materials appropriate to the surface and material being cleaned.
- F. Clean filters of operating equipment.
- G. Clean debris from roofs, gutters, downspouts, and drainage systems.
- H. Clean site; sweep paved areas, rake clean landscaped surfaces.
- I. Remove waste, surplus materials, trash/rubbish, and construction facilities from the site; dispose of in legal manner; do not burn or bury.

3.14 CLOSEOUT PROCEDURES

- A. Make submittals that are required by governing or other authorities.
 - 1. Provide copies to Architect and City of Fernandina Beach, Florida.
- B. Notify Architect when work is considered ready for Substantial Completion.
- C. 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 Architect's review.
- D. Correct items of work listed in executed Certificates of Substantial Completion and comply with requirements for access to City of Fernandina Beach, Florida-occupied areas.
- E. Notify Architect when work is considered finally complete.
- F. Complete items of work determined by Architect's final inspection.

3.15 MAINTENANCE

- A. Provide service and maintenance of components indicated in specification sections.
- B. Maintenance Period: As indicated in specification sections or, if not indicated, not less than one year from the Date of Substantial Completion or the length of the specified warranty, whichever is longer.
- C. Examine system components at a frequency consistent with reliable operation. Clean, adjust, and lubricate as required.
- D. Include systematic examination, adjustment, and lubrication of components. Repair or replace parts whenever required. Use parts produced by the manufacturer of the original component.
- E. Maintenance service shall not be assigned or transferred to any agent or subcontractor without prior written consent of the City of Fernandina Beach, Florida.

END OF SECTION

SECTION 01 71 00

AS-BUILT DRAWINGS

PART 1 - GENERAL

1.01 DESCRIPTION:

- A. Summary of Work: Prepare As- Built Drawings of the completed Site Work.

PART 2 - PRODUCTS

2.01 **AS-BUILT DRAWINGS:** The As-Built drawings shall correctly and accurately show all changes from the Contract Documents made during construction and shall reflect surveyed information which shall be performed by a professional engineer or land surveyor registered in the State of Florida. The drawings shall be prepared in electronic format in AutoCAD 2007 or later.

- A. Storm Sewer, Potable Water, Fire Protection Water, Sanitary Sewer, and Paving: As-Built drawings shall show the following information:

1. Inlets: Elevation of top of grate and invert(s) of all new or modified structures.
2. Manholes: Elevation of top rim and invert(s).
3. Stub-outs: Invert elevations and length installed.
4. Pipe: Invert elevations and Length installed.
5. Paving: As constructed elevations corresponding to plan elevations.

- B. Building and Site: As-Built Drawings shall show the following information:

1. Finish out to out Building and Canopy Dimensions.
2. Location and width of all new sidewalks. Centerline elevations at 50' o.c., tie-ins with existing concrete and pavements, changes of direction and slope.
3. Sidewalk finish floor adjacent to all entrances.
4. Locate and describe all yard hydrants and irrigation pipe.

PART 3 - EXECUTION

3.01 SUBMITTAL: The Project shall not be considered to be in substantial completion until record drawings have been submitted and accepted by the Engineer. Prior to final payment the record drawings shall be revised by the Contractor to reflect any changes which have occurred since the substantial completion submittal.

END OF SECTION

SECTION 01 74 19

CONSTRUCTION WASTE MANAGEMENT AND DISPOSAL

PART 1 GENERAL

1.01 WASTE MANAGEMENT REQUIREMENTS

- A. City of Fernandina Beach, Florida requires that this project generate the least amount of trash and waste possible.
- B. Employ processes that ensure the generation of as little waste as possible due to error, poor planning, breakage, mishandling, contamination, or other factors.
- C. Minimize trash/waste disposal in landfills; reuse, salvage, or recycle as much waste as economically feasible.
- D. Required Recycling, Salvage, and Reuse: The following may not be disposed of in landfills or by incineration:
 - 1. Aluminum and plastic beverage containers.
 - 2. Corrugated cardboard.
 - 3. Concrete.
 - 4. Bricks.
 - 5. Concrete masonry units.
 - 6. Metals, including packaging banding, metal studs, sheet metal, structural steel, piping, reinforcing bars, door frames, and other items made of steel, iron, galvanized steel, stainless steel, aluminum, copper, zinc, lead, brass, and bronze.
 - 7. Glass.
 - 8. Plastic buckets.
 - 9. Windows, doors, and door hardware.
 - 10. Plumbing fixtures.
 - 11. Mechanical and electrical equipment.
 - 12. Fluorescent lamps (light bulbs).
 - 13. Acoustical ceiling tile and panels.
- E. Contractor shall develop and follow a Waste Management Plan designed to implement these requirements.
- F. Methods of trash/waste disposal that are not acceptable are:
 - 1. Burning on the project site.
 - 2. Burying on the project site.
 - 3. Dumping or burying on other property, public or private.
 - 4. Other illegal dumping or burying.
 - 5. Incineration, either on- or off-site.
- G. Regulatory Requirements: Contractor is responsible for knowing and complying with regulatory requirements, including but not limited to Federal, state and local requirements, pertaining to legal disposal of all construction and demolition waste materials.

1.02 DEFINITIONS

- A. Clean: Untreated and unpainted; not contaminated with oils, solvents, caulk, or the like.
- B. Construction and Demolition Waste: Solid wastes typically including building materials, packaging, trash, debris, and rubble resulting from construction, remodeling, repair and demolition operations.
- C. Hazardous: Exhibiting the characteristics of hazardous substances, i.e., ignitibility, corrosivity, toxicity or reactivity.

EXHIBIT "A"

- D. Nonhazardous: Exhibiting none of the characteristics of hazardous substances, i.e., ignitibility, corrosivity, toxicity, or reactivity.
- E. Nontoxic: Neither immediately poisonous to humans nor poisonous after a long period of exposure.
- F. Recyclable: The ability of a product or material to be recovered at the end of its life cycle and remanufactured into a new product for reuse by others.
- G. Recycle: To remove a waste material from the project site to another site for remanufacture into a new product for reuse by others.
- H. Recycling: The process of sorting, cleansing, treating and reconstituting solid waste and other discarded materials for the purpose of using the altered form. Recycling does not include burning, incinerating, or thermally destroying waste.
- I. Return: To give back reusable items or unused products to vendors for credit.
- J. Reuse: To reuse a construction waste material in some manner on the project site.
- K. Salvage: To remove a waste material from the project site to another site for resale or reuse by others.
- L. Sediment: Soil and other debris that has been eroded and transported by storm or well production run-off water.
- M. Source Separation: The act of keeping different types of waste materials separate beginning from the first time they become waste.
- N. Toxic: Poisonous to humans either immediately or after a long period of exposure.
- O. Trash: Any product or material unable to be reused, returned, recycled, or salvaged.
- P. Waste: Extra material or material that has reached the end of its useful life in its intended use. Waste includes salvageable, returnable, recyclable, and reusable material.

1.03 SUBMITTALS

- A. See Section 01 30 00 - Administrative Requirements, for submittal procedures.
- B. Waste Management Plan: Include the following information:
 - 1. Analysis of the trash and waste projected to be generated during the entire project construction cycle, including types and quantities.
 - 2. Landfill Alternatives: List all waste materials that will be diverted from landfills by reuse, salvage, or recycling.
 - 3. Meetings: Describe regular meetings to be held to address waste prevention, reduction, recycling, salvage, reuse, and disposal.
 - 4. Materials Handling Procedures: Describe the means by which materials to be diverted from landfills will be protected from contamination and prepared for acceptance by designated facilities; include separation procedures for recyclables, storage, and packaging.
 - 5. Transportation: Identify the destination and means of transportation of materials to be recycled; i.e. whether materials will be site-separated and self-hauled to designated centers, or whether mixed materials will be collected by a waste hauler.

PART 3 EXECUTION

2.01 WASTE MANAGEMENT PROCEDURES

- A. See Section 01 30 00 for additional requirements for project meetings, reports, submittal procedures, and project documentation.
- B. See Section 01 50 00 for additional requirements related to trash/waste collection and removal

facilities and services.

- C. See Section 01 60 00 for waste prevention requirements related to delivery, storage, and handling.
- D. See Section 01 70 00 for trash/waste prevention procedures related to demolition, cutting and patching, installation, protection, and cleaning.

2.02 WASTE MANAGEMENT PLAN IMPLEMENTATION

- A. Manager: Designate an on-site person or persons responsible for instructing workers and overseeing and documenting results of the Waste Management Plan.
- B. Communication: Distribute copies of the Waste Management Plan to job site foreman, each subcontractor, City of Fernandina Beach, Florida, and Architect.
- C. Instruction: Provide on-site instruction of appropriate separation, handling, and recycling, salvage, reuse, and return methods to be used by all parties at the appropriate stages of the project.
- D. Meetings: Discuss trash/waste management goals and issues at project meetings.
 - 1. Pre-bid meeting.
 - 2. Pre-construction meeting.
 - 3. Regular job-site meetings.
- E. Facilities: Provide specific facilities for separation and storage of materials for recycling, salvage, reuse, return, and trash disposal, for use by all contractors and installers.
 - 1. Provide containers as required.
 - 2. Provide adequate space for pick-up and delivery and convenience to subcontractors.
 - 3. Keep recycling and trash/waste bin areas neat and clean and clearly marked in order to avoid contamination of materials.
- F. Hazardous Wastes: Separate, store, and dispose of hazardous wastes according to applicable regulations.
- G. Recycling: Separate, store, protect, and handle at the site identified recyclable waste products in order to prevent contamination of materials and to maximize recyclability of identified materials. Arrange for timely pickups from the site or deliveries to recycling facility in order to prevent contamination of recyclable materials.
- H. Reuse of Materials On-Site: Set aside, sort, and protect separated products in preparation for reuse.
- I. Salvage: Set aside, sort, and protect products to be salvaged for reuse off-site.

END OF SECTION

SECTION 01 78 00

CLOSEOUT SUBMITTALS

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Project Record Documents.
- B. Operation and Maintenance Data.
- C. Warranties and bonds.

1.02 SUBMITTALS

- A. Project Record Documents: Submit documents to Architect with claim for final Application for Payment.
- B. Operation and Maintenance Data:
 - 1. Submit two copies of preliminary draft or proposed formats and outlines of contents before start of Work. Architect will review draft and return one copy with comments.
 - 2. For equipment, or component parts of equipment put into service during construction and operated by City of Fernandina Beach, Florida, submit completed documents within ten days after acceptance.
 - 3. Submit one copy of completed documents 15 days prior to final inspection. This copy will be reviewed and returned after final inspection, with Architect comments. Revise content of all document sets as required prior to final submission.
 - 4. Submit two sets of revised final documents in final form within 10 days after final inspection.
- C. Warranties and Bonds:
 - 1. For equipment or component parts of equipment put into service during construction with City of Fernandina Beach, Florida's permission, submit documents within 10 days after acceptance.
 - 2. Make other submittals within 10 days after Date of Substantial Completion, prior to final Application for Payment.
 - 3. For items of Work for which acceptance is delayed beyond Date of Substantial Completion, submit within 10 days after acceptance, listing the date of acceptance as the beginning of the warranty period.

PART 2 PRODUCTS - NOT USED

PART 3 EXECUTION

3.01 PROJECT RECORD DOCUMENTS

- A. Maintain on site one set of the following record documents; record actual revisions to the Work:
 - 1. Drawings.
 - 2. Specifications.
 - 3. Addenda.
 - 4. Change Orders and other modifications to the Contract.
 - 5. Reviewed shop drawings, product data, and samples.
 - 6. Manufacturer's instruction for assembly, installation, and adjusting.
- B. Ensure entries are complete and accurate, enabling future reference by City of Fernandina Beach, Florida.
- C. Store record documents separate from documents used for construction.
- D. Record information concurrent with construction progress.

EXHIBIT "A"

- E. Specifications: Legibly mark and record at each product section description of actual products installed, including the following:
 - 1. Manufacturer's name and product model and number.
 - 2. Product substitutions or alternates utilized.
 - 3. Changes made by Addenda and modifications.
- F. Record Drawings and Shop Drawings: Legibly mark each item to record actual construction including:
 - 1. Measured depths of foundations in relation to finish first floor datum.
 - 2. Measured horizontal and vertical locations of underground utilities and appurtenances, referenced to permanent surface improvements.
 - 3. Measured locations of internal utilities and appurtenances concealed in construction, referenced to visible and accessible features of the Work.
 - 4. Field changes of dimension and detail.
 - 5. Details not on original Contract drawings.

3.02 OPERATION AND MAINTENANCE DATA

- A. For Each Product or System: List names, addresses and telephone numbers of Subcontractors and suppliers, including local source of supplies and replacement parts.
- B. Product Data: Mark each sheet to clearly identify specific products and component parts, and data applicable to installation. Delete inapplicable information.
- C. Drawings: Supplement product data to illustrate relations of component parts of equipment and systems, to show control and flow diagrams. Do not use Project Record Documents as maintenance drawings.
- D. Typed Text: As required to supplement product data. Provide logical sequence of instructions for each procedure, incorporating manufacturer's instructions.

3.03 OPERATION AND MAINTENANCE DATA FOR MATERIALS AND FINISHES

- A. For Each Product, Applied Material, and Finish:
 - 1. Product data, with catalog number, size, composition, and color and texture designations.
 - 2. Information for re-ordering custom manufactured products.
- B. Instructions for Care and Maintenance: Manufacturer's recommendations for cleaning agents and methods, precautions against detrimental cleaning agents and methods, and recommended schedule for cleaning and maintenance.
- C. Moisture protection and weather-exposed products: Include product data listing applicable reference standards, chemical composition, and details of installation. Provide recommendations for inspections, maintenance, and repair.
- D. Additional information as specified in individual product specification sections.

3.04 OPERATION AND MAINTENANCE DATA FOR EQUIPMENT AND SYSTEMS

- A. For Each Item of Equipment and Each System:
 - 1. Description of unit or system, and component parts.
 - 2. Identify function, normal operating characteristics, and limiting conditions.
 - 3. Include performance curves, with engineering data and tests.
 - 4. Complete nomenclature and model number of replaceable parts.
- B. Panelboard Circuit Directories: Provide electrical service characteristics, controls, and communications; typed.
- C. Include color coded wiring diagrams as installed.
- D. Operating Procedures: Include start-up, break-in, and routine normal operating instructions and

- sequences. Include regulation, control, stopping, shut-down, and emergency instructions. Include summer, winter, and any special operating instructions.
- E. Maintenance Requirements: Include routine procedures and guide for preventative maintenance and trouble shooting; disassembly, repair, and reassembly instructions; and alignment, adjusting, balancing, and checking instructions.
 - F. Provide servicing and lubrication schedule, and list of lubricants required.
 - G. Include manufacturer's printed operation and maintenance instructions.
 - H. Include sequence of operation by controls manufacturer.
 - I. Provide original manufacturer's parts list, illustrations, assembly drawings, and diagrams required for maintenance.
 - J. Provide control diagrams by controls manufacturer as installed.
 - K. Provide Contractor's coordination drawings, with color coded piping diagrams as installed.
 - L. Provide charts of valve tag numbers, with location and function of each valve, keyed to flow and control diagrams.
 - M. Provide list of original manufacturer's spare parts, current prices, and recommended quantities to be maintained in storage.
 - N. Include test and balancing reports.
 - O. Additional Requirements: As specified in individual product specification sections.

3.05 OPERATION AND MAINTENANCE MANUALS

- A. Prepare instructions and data by personnel experienced in maintenance and operation of described products.
- B. Prepare data in the form of an instructional manual.
- C. Binders: Commercial quality, 8-1/2 by 11 inch three D side ring binders with durable plastic covers; 2 inch maximum ring size. When multiple binders are used, correlate data into related consistent groupings.
- D. Cover: Identify each binder with typed or printed title OPERATION AND MAINTENANCE INSTRUCTIONS; identify title of Project; identify subject matter of contents.
- E. Provide tabbed dividers for each separate product and system, with typed description of product and major component parts of equipment.
- F. Text: Manufacturer's printed data, or typewritten data on 24 pound paper.
- G. Drawings: Provide with reinforced punched binder tab. Bind in with text; fold larger drawings to size of text pages.
- H. Arrange content by systems under section numbers and sequence of Table of Contents of this Project Manual.
- I. Contents: Prepare a Table of Contents for each volume, with each product or system description identified, in three parts as follows:
 - 1. Part 1: Directory, listing names, addresses, and telephone numbers of Architect, Contractor, Subcontractors, and major equipment suppliers.
 - 2. Part 2: Operation and maintenance instructions, arranged by system and subdivided by specification section. For each category, identify names, addresses, and telephone numbers of Subcontractors and suppliers. Identify the following:
 - a. Significant design criteria.

EXHIBIT "A"

- b. List of equipment.
 - c. Parts list for each component.
 - d. Operating instructions.
 - e. Maintenance instructions for equipment and systems.
 - f. Maintenance instructions for special finishes, including recommended cleaning methods and materials, and special precautions identifying detrimental agents.
3. Part 3: Project documents and certificates, including the following:
- a. Shop drawings and product data.
 - b. Air and water balance reports.
 - c. Certificates.
 - d. Photocopies of warranties and bonds.
- J. Provide a listing in Table of Contents for design data, with tabbed dividers and space for insertion of data.
- K. Table of Contents: Provide title of Project; names, addresses, and telephone numbers of Architect, Consultants, and Contractor with name of responsible parties; schedule of products and systems, indexed to content of the volume.

3.06 WARRANTIES AND BONDS

- A. Obtain warranties and bonds, executed in duplicate by responsible Subcontractors, suppliers, and manufacturers, within 10 days after completion of the applicable item of work. Except for items put into use with City of Fernandina Beach, Florida's permission, leave date of beginning of time of warranty until the Date of Substantial completion is determined.
- B. Verify that documents are in proper form, contain full information, and are notarized.
- C. Co-execute submittals when required.
- D. Retain warranties and bonds until time specified for submittal.
- E. Include originals of each in operation and maintenance manuals, indexed separately on Table of Contents.

END OF SECTION

SECTION 02 06 00

SOIL BORINGS

PART 1 - GENERAL

1.01 DESCRIPTION:

- A. The soil boring logs contained in the Geotechnical Report are provided for the Contractor's information only. The logs are only intended to provide a general indication of the soils at the site and may vary away from the boring location. The Contractor shall satisfy himself as to the character and amount of different soil materials, groundwater and subsurface conditions to be encountered in the work to be performed. Subsurface information included in these specifications is the result of borings made at the exact locations shown only. While the borings show the subsurface conditions at their respective exact locations, local variations in soils and groundwater conditions will be encountered.

- B. It is to be expressly understood that the Owner or Engineer will not be responsible for any interpretation or conclusion drawn therefrom.

PART 2 - PRODUCTS

(Not Applicable)

PART 3 - EXECUTION

- 3.01 Although the borings do not reveal every subsurface condition, the geotechnical engineer has made general recommendations from the information provided by the boring logs. The Contractor shall consider all recommendations made in this report to be the minimum requirements for placement of soil and soil preparation on this project.

END OF SECTION



UNIVERSAL ENGINEERING SCIENCES

REPORT OF A GEOTECHNICAL EXPLORATION

City of Fernandina Beach Library Expansion
Fernandina Beach, Florida

November 1, 2012

PROJECT NO. 0930.1200181.0000
REPORT NO. 996280

Prepared For:

City of Fernandina Beach
204 Ash Street
Fernandina Beach, FL 32034

Prepared By:

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CONSULTANTS:

Geotechnical Engineering ▪ Environmental Engineering ▪ Construction Materials Testing
Threshold Inspection ▪ Private Provider Inspection

OFFICES: Clermont, FL ▪ Daytona Beach, FL ▪ DeBary, FL ▪ Fort Myers, FL ▪ Gainesville, FL ▪ Hollywood, FL ▪ Jacksonville, FL ▪ Norcross, GA ▪ Ocala, FL
Orlando, FL ▪ Palm Coast, FL ▪ Pensacola, FL ▪ Rockledge, FL ▪ Sarasota, FL ▪ St. Augustine, FL ▪ Tampa, FL ▪ West Palm Beach, FL



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• Sarasota, FL
• Tampa, FL
• West Palm Beach, FL

November 1, 2012

City of Fernandina Beach
204 Ash Street
Fernandina Beach, FL 32034

Attention: Mr. Joseph Gerrity

Reference: **REPORT OF A GEOTECHNICAL EXPLORATION**
City of Fernandina Beach Library Expansion
Fernandina Beach, Florida
UES Project No. 0930.1200181.0000 and Report No. 996280

Dear Mr. Gerrity:

Universal Engineering Sciences, Inc. has completed a subsurface exploration for the proposed project in Fernandina Beach, Florida. These services were provided in general accordance with our Proposal No. 2012J-476 dated September 17, 2012. This report contains the results of our exploration, an engineering evaluation with respect to the project characteristics described to us, and recommendations for groundwater considerations, foundation design, and site preparation. A summary of our findings is as follows:


- Beneath a layer of asphalt and limerock, the borings generally encountered loose to medium dense fine sand (SP) in the upper 17.5 feet underlain with very loose to medium dense silty fine sand (SM) and clayey fine sand (SC) to the 30-foot boring termination depths.
- We measured the stabilized groundwater level at the boring locations at a depth of 5.2 to 5.3 feet below the existing grade. We estimate the seasonal high groundwater level will occur at 4 feet below the ground surface.
- Assuming the building area will be constructed in accordance with our Site Preparation Recommendations, we have recommended the proposed structure be supported on conventional, shallow spread foundations with an allowable soil bearing pressure of 2,500 pounds per square foot.
- We recommend only normal, good practice site preparation techniques to prepare the existing subgrade to support the proposed structure. These techniques include clearing the construction areas of existing construction and utilities, compacting the subgrade and placing engineered fill to the desired grades.

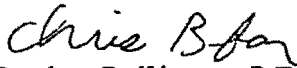
We trust this report meets your needs and addresses the geotechnical issues associated with the proposed construction. We appreciate the opportunity to have worked with you on this project and look forward to a continued association. Please do not hesitate to contact us if you should have any questions, or if we may further assist you as your plans proceed.

Respectfully submitted,

UNIVERSAL ENGINEERING SCIENCES, INC.

Certificate of Authorization No. 549


Matt McLeer, P.E.
Senior Project Manager
FL P.E. Number 65027
Date: 11/1/12


Stephen R. Weaver, P.E.
Geotechnical Services Manager
FL P.E. Number 37389

SRW/srw

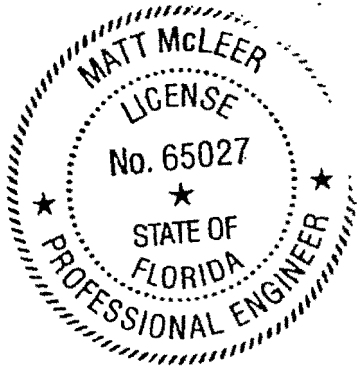


TABLE OF CONTENTS

1.0 INTRODUCTION	1
1.1 GENERAL	1
2.0 SCOPE OF SERVICES	1
2.1 PROJECT DESCRIPTION	1
2.2 PURPOSE	2
2.3 FIELD EXPLORATION	2
2.3.1 SPT Borings	2
2.3.2 Auger Borings	3
2.4 LABORATORY TESTING	3
3.0 FINDINGS	3
3.1 SOIL SURVEY	3
3.2 SURFACE CONDITIONS	4
3.3 SUBSURFACE CONDITIONS	4
4.0 RECOMMENDATIONS	4
4.1 GENERAL	4
4.2 GROUNDWATER CONSIDERATIONS	5
4.3 BUILDING FOUNDATIONS	5
4.3.1 Bearing Pressure	5
4.3.2 Foundation Size	6
4.3.3 Bearing Depth	6
4.3.4 Bearing Material	6
4.3.5 Stabilization of Existing Foundations	6
4.3.6 Settlement Estimates	6
4.3.7 Floor Slabs	7
4.4 SITE PREPARATION	7
4.5 CONSTRUCTION RELATED SERVICES	9
5.0 LIMITATIONS	9



1.0 INTRODUCTION

1.1 GENERAL

In this report, we present the results of the subsurface exploration of the proposed library expansion in Fernandina Beach, Florida. We have divided this report into the following sections:

- SCOPE OF SERVICES - Defines what we did
- FINDINGS - Describes what we encountered
- RECOMMENDATIONS - Describes what we encourage you to do
- LIMITATIONS - Describes the restrictions inherent in this report
- APPENDICES - Presents support materials referenced in this report

2.0 SCOPE OF SERVICES

2.1 PROJECT DESCRIPTION

Project information was provided to us in recent correspondence with you. We were provided with a copy of a Schematic Design of the site, dated September 18, 2012. This plan shows the boundary limits for the property, the roadways located adjacent to the site, and the layout of the existing and proposed construction.

We understand that the project consists of construction of an addition to the existing library facility in Fernandina Beach, Florida. Detailed structural loads for the structure have not been provided to us, therefore we have assumed maximum wall and column loads will not exceed 3 klf and 75 kips, respectively. Detailed grading information has not been provided; therefore we assume elevating fill heights will not exceed two feet.

Our recommendations are based upon the above considerations. If any of this information is incorrect, or if you anticipate any changes, please inform Universal Engineering Sciences so that we may review our recommendations.



2.2 PURPOSE

The purposes of this exploration were:

- to explore the general subsurface conditions at the site;
- to interpret and evaluate the subsurface conditions with respect to the proposed construction; and
- to provide geotechnical engineering recommendations for groundwater considerations, foundation design, and site preparation.

This report presents an evaluation of site conditions on the basis of traditional geotechnical procedures for site characterization. The recovered samples were not examined, either visually or analytically, for chemical composition or environmental hazards. Universal Engineering Sciences would be pleased to perform these services, if you desire.

Our exploration was confined to the zone of soil likely to be stressed by the proposed construction. Our work did not address the potential for surface expression of deep geological conditions. This evaluation requires a more extensive range of field services than performed in this study. We will be pleased to conduct an investigation to evaluate the probable effect of the regional geology upon the proposed construction, if you desire.

2.3 FIELD EXPLORATION

A field exploration was performed on October 23, 2012. The approximate boring locations are shown on the attached Boring Location Plan in Appendix A. The approximate boring locations were determined in the field by our personnel using taped measurements from existing features at the site, and should be considered accurate only to the degree implied by the method of measurement used. Samples of the soils encountered will be held in our laboratory for your inspection for 60 days unless we are notified otherwise.

2.3.1 SPT Borings

To explore the subsurface conditions within the area of the proposed building, we located and drilled two (2) Standard Penetration Test (SPT) borings to depths of approximately 30 feet below the existing ground surface in general accordance with the methodology outlined in ASTM D 1586. A summary of this field procedure is included in Appendix A. Split-spoon soil samples recovered during performance of the borings were visually classified in the field and representative portions of the samples were transported to our laboratory for further evaluation.



2.3.2 Auger Borings

We located and drilled one (1) auger boring to a depth 6 feet below the existing ground surface in general accordance with the methodology outlined in ASTM D 1452. A summary of this field procedure is included in Appendix A. Representative soil samples recovered from the auger borings were returned to our laboratory for further evaluation.

2.4 LABORATORY TESTING

Representative soil samples obtained during our field exploration were returned to our office and classified by a geotechnical engineer. The samples were visually classified in general accordance with ASTM D 2488 (Unified Soil Classification System).

Three (3) percent fines tests and three (3) natural moisture tests were conducted in the laboratory on representative soil samples obtained from the borings. These tests were performed to provide preliminary information for the proposed pond area. The results of these tests are presented on the Boring Logs in Appendix A. A brief description of the laboratory procedures used is also provided in Appendix A.

3.0 FINDINGS

3.1 SOIL SURVEY

Based on the 1991 Soil Survey for Nassau County, Florida, as prepared by the US Department of Agriculture Soil Conservation Service, the predominant predevelopment soil types at the site are identified as Urban Land.

A summary of characteristics of this soil series was obtained from the Soil Survey and is included in Table 1.

TABLE 1 Summary of Soil Survey Information							
Soil Type	Constituents		Hydrologic Group	Natural Drainage	Soil Permeability (Inches/Hr)		Seasonal High Water Table
Urban Land (69)	0-6"	Variable	-	Variable	0-5"	-	-



3.2 SURFACE CONDITIONS

The site of the subject project is located on the southwest quadrant of Alachua Street and North 4th Street in Fernandina Beach, Florida. At the time of our visit, the site was developed with an asphalt parking lot. Surface water was not observed on site at the time of our exploration.

3.3 SUBSURFACE CONDITIONS

The boring locations and detailed subsurface conditions are illustrated in Appendix A: Boring Location Plan and Boring Logs. It should be noted that soil conditions will vary away from and between boring locations. The classifications and descriptions shown on the logs are generally based upon visual characterizations of the recovered soil samples and a limited number of laboratory tests. Also, see Appendix A: Key to Boring Logs, for further explanation of the symbols and placement of data on the Boring Logs. Table 2: General Soil Profile summarizes the soil conditions encountered.

Typical depth (ft)		Soil Descriptions
From	To	
0	0.6	Asphalt, Limerock
0.6	17.5	Loose to medium dense fine sand (SP)
17.5	30*	Very loose to medium dense silty fine sand (SM) and clayey fine sand (SC)

* Termination Depth of Deepest Boring
() Indicates Unified Soil Classification

The stabilized groundwater level was recorded at a depth of 5.2 to 5.3 feet below the existing ground surface.

4.0 RECOMMENDATIONS

4.1 GENERAL

In this section of the report, we present our detailed recommendations for groundwater control, building foundation, site preparation, and construction related services. The following recommendations are made based upon a review of the attached soil test data, our understanding of the proposed construction, and experience with similar projects and subsurface conditions. We recommend that we be provided the opportunity to review the project plans and specifications to confirm that our recommendations have been properly interpreted and implemented. If the structural loadings or the building location change significantly from those discussed previously, we request the opportunity to review and possibly amend our recommendations with respect to



those changes. The discovery of any subsurface conditions during construction which deviate from those encountered in the borings should be reported to us immediately for observation, evaluation and recommendations.

4.2 GROUNDWATER CONSIDERATIONS

The groundwater table will fluctuate seasonally depending upon local rainfall. The rainy season in Northeast Florida is normally between June and September. Based upon our review of U.S.G.S. data, Nassau County Soils Survey, and regional hydrogeology, it is our opinion the seasonal high water level will occur 4 feet below the existing ground surface.

Note, it is possible the estimated seasonal high groundwater levels will temporarily exceed these estimated levels during any given year in the future. Should impediments to surface water drainage exist on the site, or should rainfall intensity and duration, or total rainfall quantities exceed the normally anticipated rainfall quantities, groundwater levels may exceed our seasonal high estimates. We recommend positive drainage be established and maintained on the site during construction. We further recommend permanent measures be constructed to maintain positive drainage from the site throughout the life of the project. We recommend all foundation and pavement grade designs be based on the seasonal high groundwater conditions.

4.3 BUILDING FOUNDATIONS

Based on the results of our exploration, we consider the subsurface conditions at the site adaptable for support of the proposed structure when constructed on a properly designed conventional shallow foundation system. Provided the site preparation and earthwork construction recommendations outlined in Section 4.4 of this report are performed, the following parameters may be used for foundation design.

4.3.1 Bearing Pressure

The maximum allowable net soil bearing pressure for use in shallow foundation design should not exceed 2,500 psf. Net bearing pressure is defined as the soil bearing pressure at the foundation bearing level in excess of the natural overburden pressure at that level. The foundations should be designed based on the maximum load which could be imposed by all loading conditions.

The foundations in areas adjacent to the existing structure may need special consideration. It is recommended that the addition be structurally independent of the existing building, since the additional loads of the new structure on existing footings may cause detrimental settlement and unsightly cracking. For the same reason, new footings should be located in such a way that the stresses under new footings will not overstress the soil under existing footings. This problem applies to new footings in the critical zone which extends about 5 feet laterally from the existing footings.



4.3.2 Foundation Size

The minimum widths recommended for any isolated column footings and continuous wall footings are 24 inches and 18 inches, respectively. Even though the maximum allowable soil bearing pressure may not be achieved, these width recommendations should control the minimum size of the foundations.

4.3.3 Bearing Depth

The exterior foundations should bear at a depth of at least 18 inches below the finished exterior grades and the interior foundations should bear at a depth of at least 12 inches below the finish floor elevation to provide confinement to the bearing level soils. It is recommended that stormwater be diverted away from the building exteriors to reduce the possibility of erosion beneath the exterior footings.

4.3.4 Bearing Material

The foundations may bear in either the compacted suitable natural soils or compacted structural fill. The bearing level soils, after compaction, should exhibit densities equivalent to at least 95 percent of the Modified Proctor maximum dry density (ASTM D 1557) to a depth of at least one foot below the foundation bearing level.

4.3.5 Stabilization of Existing Foundations

During excavation of the proposed footings in close proximity to footings supporting the existing structure, it may be required to stabilize the existing footings to preclude settlement of the existing structure. The stabilization of the existing footings should be the responsibility of the contractor, but could include bracing/shoring, underpinning, and/or chemical grouting.

4.3.6 Settlement Estimates

Post-construction settlements of the structure will be influenced by several interrelated factors, such as (1) subsurface stratification and strength/compressibility characteristics; (2) footing size, bearing level, applied loads, and resulting bearing pressures beneath the foundations; and (3) site preparation and earthwork construction techniques used by the contractor. Our settlement estimates for the structure are based on the use of site preparation/earthwork construction techniques as recommended in Section 4.4 of this report. Any deviation from these recommendations could result in an increase in the estimated post-construction settlements of the structure.

Due to the sandy nature of the near-surface soils, we expect the majority of settlement to occur in an elastic manner and fairly rapidly during construction. Using the recommended maximum bearing pressure, the assumed maximum structural loads and the field data which we have



correlated to geotechnical strength and compressibility characteristics of the subsurface soils, we estimate that total settlements of the structure could be on the order of one inch or less.

Differential settlements result from differences in applied bearing pressures and variations in the compressibility characteristics of the subsurface soils. Because of the general uniformity of the subsurface conditions and the recommended site preparation and earthwork construction techniques outlined in Section 4.4, we anticipate that differential settlements of the structure should be within tolerable magnitudes ($\frac{1}{2}$ inch or less).

The foundation loads transmitted to soil from the proposed addition and additional story may result in additional stresses to the soil supporting the existing structure. The additional stresses may result in settlement of the existing structure and isolated, minor cracking of the existing structure. The project budget should allow for cosmetic repairs of isolated, minor cracking.

4.3.7 Floor Slabs

The floor slab can be constructed as a slab-on-grade member using a modulus of subgrade reaction (K) of 100 pci provided the subgrade materials are compacted as outlined in Section 4.4. It is recommended the floor slab bearing soils be covered with an impervious membrane to reduce moisture entry and floor dampness in accordance with current Florida Building Code requirements. A 10-mil thick plastic membrane is commonly used for this purpose. Care should be exercised not to tear the membrane during placement of reinforcing steel and concrete.

4.4 SITE PREPARATION

We recommend normal, good practice site preparation procedures. These procedures include: stripping the site of any existing pavement or foundations, vegetation and topsoil, removing any debris, compacting the subgrade, and placing necessary fill or backfill to grade with engineered fill. A more detailed synopsis of this work is as follows:

1. Prior to construction, the location of any existing underground utility lines within the construction area should be established. Provisions should then be made to relocate interfering utilities to appropriate locations. It should be noted that if underground pipes are not properly removed or plugged, they may serve as conduits for subsurface erosion which may subsequently lead to excessive settlement of overlying structure(s).
2. Strip the proposed construction limits of any existing pavement, foundations, and other deleterious materials within and 5 feet beyond the perimeter of the proposed building areas and within and 3 feet beyond the perimeter of the proposed pavement areas. Expect typical stripping at this site to depths of 6 to 12 inches. Some isolated areas may require more than a foot of stripping or undercutting due to larger debris or asphalt parking.



3. The groundwater level should be maintained at least 2 feet below the surface of any vibratory compaction procedures. If required, temporary groundwater control can probably be achieved by pumping from sumps located in perimeter ditches. Each sump should be located outside the bearing area to avoid loosening of the fine sandy bearing soils.
4. Compact the exposed surface using tracked equipment and/or lightweight, hand-held, equipment. Vibratory roller equipment is not recommended in order to preclude imparting significant vibrations to the existing structure. Also, it is recommended the tracked equipment be operated no closer than 5 feet to the existing structure. The upper one foot of soils below the exposed surface (after stripping and grubbing) within the addition area should be improved to achieve a minimum compaction requirement of 95% of the Modified Proctor Test (ASTM D-1557). We recommend the compacted soils exhibit a moisture content within 2 percent of the soils optimum moisture content as determined by the Modified Proctor Test (ASTM D-1557).

Should the bearing level soils experience pumping and soil strength loss during the compaction operations, compaction work should be immediately terminated and (1) the disturbed soils removed and backfilled with dry structural fill soils which are then compacted, or (2) the excess pore pressures within the disturbed soils allowed to dissipate before recompacting.

5. Place fill material, as required. The fill should consist of "clean," fine sand with less than 5 percent soil fines. You may use fill materials with soil fines between 5 and 12 percent, but strict moisture control may be required. Typically, the soils should exhibit moisture contents within ± 2 percent of the Modified Proctor optimum moisture content during compaction. Place fill in uniform 10- to 12-inch loose lifts and compact each lift to a minimum density of 95 percent of the Modified Proctor maximum dry density.
6. Perform compliance tests within the fill/backfill at a frequency of not less than one test per 2,500 square feet per lift in the building areas, or at a minimum of two tests per building, whichever is greater.
7. Test all footing cuts for compaction to a depth of 1 foot. As previously mentioned, it may be necessary to stabilize the existing footings in close proximity to the proposed footings. We recommend you conduct density testing in every column footing, and every 100 linear feet in wall footings. Recompanction of the foundation excavation bearing level soils, if loosened by the excavation process, can probably be achieved by making several coverages with a light weight walk-behind vibratory sled or roller.



4.5 CONSTRUCTION RELATED SERVICES

We recommend the owner retain Universal Engineering Sciences to perform construction materials tests and observations on this project. Field tests and observations include verification of foundation and pavement subgrades by performing quality assurance tests on the placement of compacted structural fill and pavement courses. We can also provide concrete testing, pavement section testing, structural steel testing, and general construction observation services.

The geotechnical engineering design does not end with the advertisement of the construction documents. The design is an on-going process throughout construction. Because of our familiarity with the site conditions and the intent of the engineering design, we are most qualified to address problems that might arise during construction in a timely and cost-effective manner.

5.0 LIMITATIONS

During the early stages of most construction projects, geotechnical issues not addressed in this report may arise. Because of the natural limitations inherent in working with the subsurface, it is not possible for a geotechnical engineer to predict and address all possible problems. An Association of Engineering Firms Practicing in the Geosciences (ASFE) publication, "Important Information About Your Geotechnical Engineering Report" appears in Appendix B, and will help explain the nature of geotechnical issues.

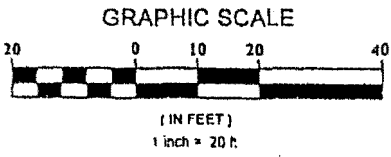
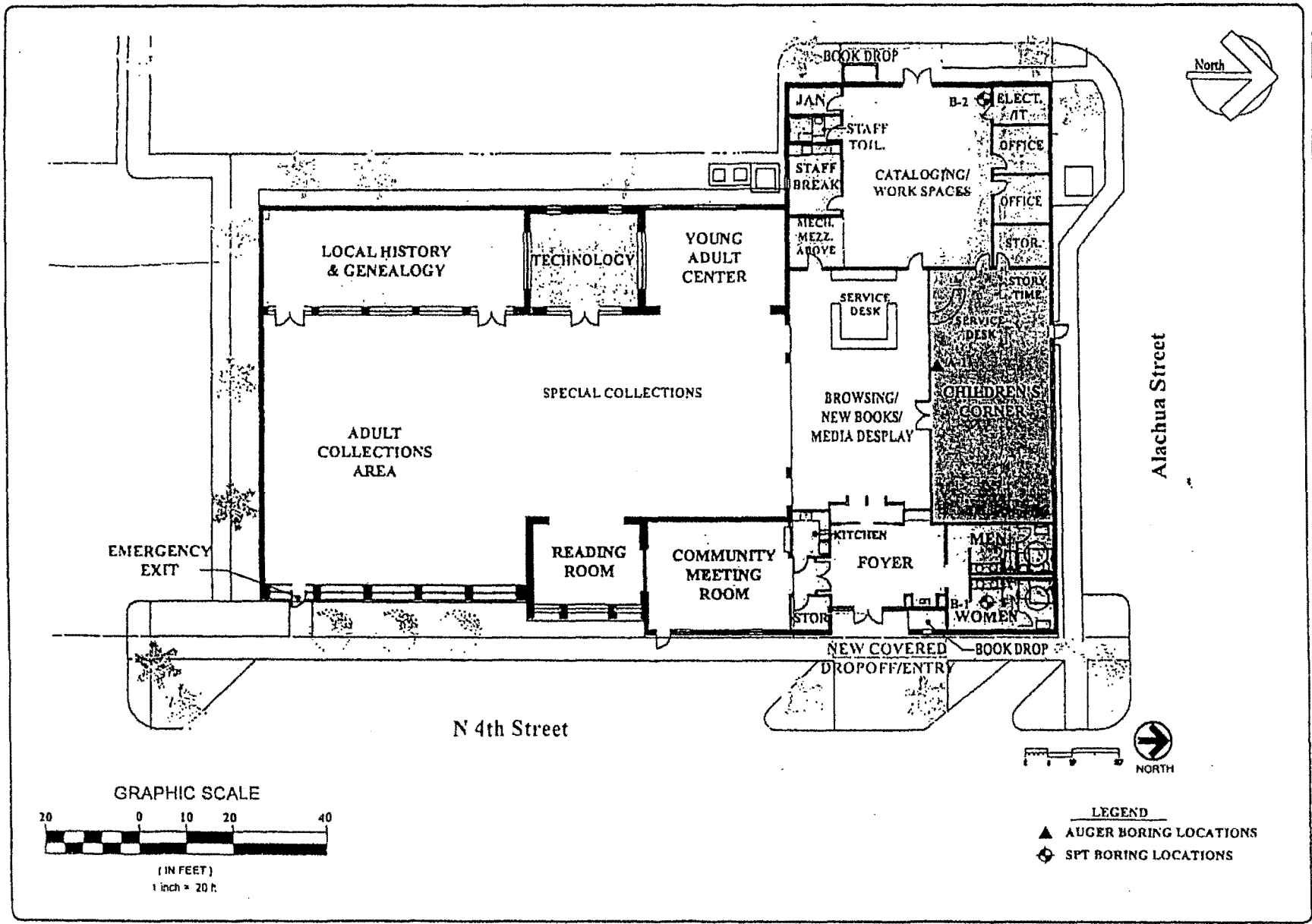
Our field exploration found unsuitable or unexpected materials at the time of occurrence. However, borings for a typical geotechnical report are widely spaced and generally not sufficient for reliably detecting the presence of isolated, anomalous surface or subsurface conditions, or reliably estimating unsuitable or suitable material quantities. Accordingly, UES does not recommend relying on our boring information to negate presence of anomalous materials or for estimation of material quantities unless our contracted services *specifically* include sufficient exploration for such purpose(s) and within the report we so state that the level of exploration provided should be sufficient to detect such anomalous conditions or estimate such quantities. Therefore, UES will not be responsible for any extrapolation or use of our data by others beyond the purpose(s) for which it is applicable or intended.

Further, we present documents in Appendix B: Constraints and Restrictions, to bring to your attention the potential concerns and the basic limitations of a typical geotechnical report.



APPENDIX A

BORING LOCATION PLAN
BORING LOGS
KEY TO BORING LOGS
FIELD EXPLORATION PROCEDURES
LABORATORY TESTING PROCEDURES



- LEGEND
- ▲ AUGER BORING LOCATIONS
 - ◆ SPT BORING LOCATIONS

CLIENT:	CITY OF FERNANDINA BEACH		
DRAWN BY: TM	DATE: 10/31/12	CHECKED BY: MM	DATE: 10/31/12
PROJECT NO: 093012001B1.0000		REPORT NO:	
GEO TECHNICAL EXPLORATION FERNANDINA BEACH LIBRARY FERNANDINA BEACH, FLORIDA		BORING LOCATION PLAN	
UNIVERSAL ENGINEERING SCIENCES		PAGE NO: A-1	



UNIVERSAL ENGINEERING SCIENCES BORING LOG

PROJECT NO.:	0930.1200181.0000
REPORT NO.:	
PAGE:	A-3

PROJECT: GEOTECHNICAL EXPLORATION
FERNANDINA BEACH LIBRARY
FERNANDINA BEACH, FLORIDA

BORING DESIGNATION: **B-2**
SECTION: **TOWNSHIP:**

SHEET: **1 of 1**
RANGE:

CLIENT: CITY OF FERNANDINA BEACH

G.S. ELEVATION (ft):

DATE STARTED: 10/23/12

LOCATION: SEE BORING LOCATION PLAN

WATER TABLE (ft): 5.2

DATE FINISHED: 10/23/12

REMARKS:

DATE OF READING: 10/23/12

DRILLED BY: PB/MIKE

EST. W.S.W.T. (ft):

TYPE OF SAMPLING: ASTM D 1586

DEPTH (FT.)	SAMPLE	BLOWS PER 6" INCREMENT	N (BLOWS/ FT.)	W.T.	SYMBOL	DESCRIPTION	-200 (%)	MC (%)	ATTERBERG LIMITS		K (FT./ DAY)	ORG. CONT. (%)
									LL	PI		
0						ASPHALT (2 3/8")						
						LIMEROCK (3 1/4")						
		2-3-3	6			Loose tan fine SAND (SP)						
5		3-3-3	6									
		2-3-2	5									
		1-2-2	4			Loose to medium dense light brown fine SAND (SP)	1.0	26.1				
		2-4-6	10									
10		3-5-9	14									
						Medium dense brown fine SAND (SP)						
15		7-10-15	25									
						Very loose to medium dense bluish gray CLAYEY fine SAND (SC)						
20		1-1-1	2									
		1-2-4	6									
25												
		5-5-6	11									
30												

BORING LOG: 0930.1200181.0000-FERNANDINA BEACH LIBRARY.GPJ UNENGS.C.GOT 11/1/12

EXHIBIT "A"



UNIVERSAL ENGINEERING SCIENCES
BORING LOG

PROJECT NO.: 0930.1200181.0000
REPORT NO.:
PAGE: A-1

PROJECT: GEOTECHNICAL EXPLORATION
FERNANDINA BEACH LIBRARY
FERNANDINA BEACH, FLORIDA

BORING DESIGNATION: **A-1**
SECTION: TOWNSHIP:

SHEET: **1 of 1**
RANGE:

CLIENT: CITY OF FERNANDINA BEACH
LOCATION: SEE BORING LOCATION PLAN
REMARKS:

G.S. ELEVATION (ft): DATE STARTED: 10/23/12
WATER TABLE (ft): 5.3 DATE FINISHED: 10/23/12
DATE OF READING: 10/23/12 DRILLED BY: PB/MIKE
EST. W.S.W.T. (ft): TYPE OF SAMPLING: ASTM D 1586

DEPTH (FT.)	SAMPLE	BLOWS PER 6" INCREMENT	N (BLOWS/ FT.)	W.T.	SYMBOL	DESCRIPTION	-200 (%)	MC (%)	ATTERBERG LIMITS		K (FT./ DAY)	ORG. CONT. (%)
									LL	PI		
0						ASPHALT (2") LIMEROCK (5") Tan to brown fine SAND (SP)						
						Light brown fine SAND (SP)						
5												

BORING 0930.1200181.0000-FERNANDINA BEACH LIBRARY.GPJ UNENGS.C.GDT 11/11/12



UNIVERSAL ENGINEERING SCIENCES BORING LOG

PROJECT NO.:	0930.1200181.0000
REPORT NO.:	
PAGE:	A-2

PROJECT: GEOTECHNICAL EXPLORATION
FERNANDINA BEACH LIBRARY
FERNANDINA BEACH, FLORIDA

BORING DESIGNATION: **B-1**
SECTION: **TOWNSHIP:**

SHEET: 1 of 1
RANGE:

CLIENT: CITY OF FERNANDINA BEACH

G.S. ELEVATION (ft):

DATE STARTED: 10/23/12

LOCATION: SEE BORING LOCATION PLAN

WATER TABLE (ft): 5.3

DATE FINISHED: 10/23/12

REMARKS:

DATE OF READING: 10/23/12

DRILLED BY: PB/MIKE

EST. W.S.W.T. (ft):

TYPE OF SAMPLING: ASTM D 1588

DEPTH (FT.)	S A M P L E	BLOWS PER 6" INCREMENT	N (BLOWS/ FT.)	W.T.	S Y M B O L	DESCRIPTION	-200 (%)	MC (%)	ATTERBERG LIMITS		K (FT./ DAY)	ORG. CONT. (%)
									LL	PI		
0						ASPHALT (1 7/8")						
						LIMEROCK (4 7/8")						
		4-10-3	13			Medium dense grayish-brown fine SAND with red Brick (SP)						
		3-3-3	6			Loose tan fine SAND (SP)						
5		2-2-3	5			Loose to tight brown fine SAND (SP)						
		2-2-3	5									
		2-3-5	8									
10		2-5-8	13			Medium dense brown fine SAND (SP)						
						Medium dense grayish-brown fine SAND (SP)						
15		5-7-5	12									
						Very loose gray Silty fine SAND with trace Shell (SM)						
20		2-1-1	2									
						Loose to medium dense gray CLAYEY fine SAND (SC)						
25		2-4-6	10				21.6	39.9				
30		3-4-8	12				46.6	21.7				

BORING NO. 0930.1200181.0000-FERNANDINA BEACH LIBRARY.GPJ UNIENGS.CDT 11/1/12



KEY TO BORING LOGS

SYMBOLS

SYMBOL	DESCRIPTION
N	No. of blows of a 140-lb weight falling 30 inches required to drive standard spoon 1 foot.
WOR	Weight of Drill Rods
WQH	Weight of Drill Rods and Hammer
% REC	Percent Core Recovery from Rock Core Drilling
RQD	Rock Quality Designation
EOB	End Of Boring
BT	Boring Terminated
-200	Fines Content or % Passing NO. 200 Sieve
MC	Moisture Content
LI	Liquid Limit
PI	Plasticity Index
K	Coefficient of Permeability
O.C.	Organic Content
☒	Estimated seasonal high groundwater level
☒	Measured groundwater level at time of drilling

UNIFIED CLASSIFICATION SYSTEM

MAJOR DIVISIONS		GROUP SYMBOLS	TYPICAL NAMES
COARSE-GRAINED SOILS More than 50% retained on No. 200 sieve*	GRAVELS 50% or more of coarse fraction retained on No. 4 sieve	CLEAN GRAVELS	GW Well-graded gravels and gravel-sand mixtures, little or no fines
		GRAVELS WITH FINES	GM Silty gravels, gravel-sand-silt mixtures
	SANDS More than 30% of coarse fraction passes No. 4 sieve	CLEAN SANDS	SW** Well-graded sands and gravelly sands, little or no fines
		SANDS WITH FINES	SP** Well-graded sands and gravelly sands, little or no fines
			SM** Silty sands, sand-silt mixtures
			SC** Clayey sands, sand-clay mixtures
FINE-GRAINED SOILS 50% or more passes No. 200 sieve*	SILTS AND CLAYS Liquid limit 50% or less		ML Inorganic silts, very fine sands, rock flour, silty or clayey fine sands
			CL Inorganic clays of low to medium plasticity, gravelly clays, sandy clays, silty clays, lean clays
	SILTS AND CLAYS Liquid limit greater than 50%		OL Organic silts and organic silty clays of low plasticity
			Mh Inorganic silts, micaceous or diatomaceous fine sands or silts, elastic silts
			CH Organic clays of high plasticity, fat clays
			OH Organic clays of medium to high plasticity
		PT Peat, muck and other highly organic soils	

* Based on the material passing the 3-in. (75 mm) sieve
 ** Use dual symbol (such as, SP-SM and SP-SC) for soil with more than 5% but less than 12% passing through No. 200 sieve.

RELATIVE DENSITY
(sand-silt)

- Very Loose - Less Than 4 Blows/Ft
- Loose - 4 to 10 Blows/Ft
- Medium - 11 to 30 Blows/Ft
- Dense - 31 to 50 Blows/Ft
- Very Dense - More Than 50 Blows/Ft

CONSISTENCY
(clay)

- Very Soft - Less than 2 Blows/Ft
- Soft - 2 to 4 Blows/Ft
- Medium - 5 to 8 Blows/Ft
- Stiff - 9 to 15 Blows/Ft
- Very Stiff - 16 to 30 Blows/Ft
- Hard - More Than 30 Blows/Ft

RELATIVE HARDNESS
(Limestone)

- Soft - 100 Blows for more than 2"
- Hard - 100 Blows for less than 2"

MODIFIERS

These modifiers provide our estimate of the amount of minor constituents (SILT or CLAY sized particles) in the soil sample.

- Trace - 5% or less
- With SILT or with CLAY - 6% to 11%
- SILTY or CLAYEY - 12% to 30%
- Very SILTY or Very CLAYEY - 31% to 50%

These modifiers provide our estimate of the amount of organic components in the soil sample.

- Trace - 1% to 2%
- Few - 3% to 4%
- Some - 5% to 9%
- Many - Greater than 9%

These modifiers provide our estimate of the amount of other components (Shell, Gravel, Etc.) in the soil sample

- Trace - 5% or less
- Few - 6% to 12%
- Some - 13% to 30%
- Many - 31% to 50%

FIELD EXPLORATION PROCEDURES

Standard Penetration Test Boring

The penetration boring was made in general accordance with the latest revision of ASTM D 1586, "Penetration Test and Split-Barrel Sampling of Soils". The boring was advanced by rotary drilling techniques using a circulating bentonite fluid for borehole flushing and stability. At 2 ½ to 5 foot intervals, the drilling tools were removed from the borehole and a split-barrel sampler inserted to the borehole bottom and driven 18 inches into the soil using a 140 pound hammer falling on the average 30 inches per hammer blow. The number of blows for the final 12 inches of penetration is termed the "penetration resistance, blow count, or N-value". This value is an index to several in-place geotechnical properties of the material tested, such as relative density and Young's Modulus.

After driving the sampler 18 inches (or less if in hard rock-like material), the sampler was retrieved from the borehole and representative samples of the material within the split-barrel were placed in glass jars and sealed. After completing the drilling operations, the samples for each boring were transported to our laboratory where they were examined by our engineer in order to verify the driller's field classification.

Auger Boring

The auger boring was performed mechanically by the use of a continuous-flight auger attached to the drill rig and in general accordance with the latest revision of ASTM D 1452, "Soil Investigation and Sampling by Auger Borings". Representative samples of the soils brought to the ground surface by the augering process were placed in glass jars, sealed and transported to our laboratory where they were examined by our engineer to verify the driller's field classification.

LABORATORY TESTING PROCEDURES

Natural Moisture Content

The water content of the sample tested was determined in general accordance with the latest revision of ASTM D 2216. The water content is defined as the ratio of "pore" or "free" water in a given mass of material to the mass of solid material particles.

Percent Fines Content

The percent fines or material passing the No. 200 mesh sieve of the sample tested was determined in general accordance with the latest revision of ASTM D 1140. The percent fines are the soil particles in the silt and clay size range.

Organic Loss on Ignition (Percent Organics)

The organic loss on ignition or percent organic material in the sample tested was determined in general accordance with ASTM D 2974. The percent organics is the material, expressed as a percentage, which is burned off in a muffle furnace at 550° Celsius.

CONSTRAINTS AND RESTRICTIONS

WARRANTY

Universal Engineering Sciences has prepared this report for our client for his exclusive use, in accordance with generally accepted soil and foundation engineering practices, and makes no other warranty either expressed or implied as to the professional advice provided in the report.

UNANTICIPATED SOIL CONDITIONS

The analysis and recommendations submitted in this report are based upon the data obtained from soil borings performed at the locations indicated on the Boring Location Plan. This report does not reflect any variations which may occur between these borings.

The nature and extent of variations between borings may not become known until excavation begins. If variations appear, we may have to re-evaluate our recommendations after performing on-site observations and noting the characteristics of any variations.

CHANGED CONDITIONS

We recommend that the specifications for the project require that the contractor immediately notify Universal Engineering Sciences, as well as the owner, when subsurface conditions are encountered that are different from those present in this report.

No claim by the contractor for any conditions differing from those anticipated in the plans, specifications, and those found in this report, should be allowed unless the contractor notifies the owner and Universal Engineering Sciences of such changed conditions. Further, we recommend that all foundation work and site improvements be observed by a representative of Universal Engineering Sciences to monitor field conditions and changes, to verify design assumptions and to evaluate and recommend any appropriate modifications to this report.

MISINTERPRETATION OF SOIL ENGINEERING REPORT

Universal Engineering Sciences is responsible for the conclusions and opinions contained within this report based upon the data relating only to the specific project and location discussed herein. If the conclusions or recommendations based upon the data

APPENDIX B

**IMPORTANT INFORMATION ABOUT YOUR
GEOTECHNICAL ENGINEERING REPORT**

CONSTRAINTS AND RESTRICTIONS

DIVISION 31 - EARTHWORK

31 00 00	EARTHWORK	11
31 20 00	SITE CLEARING, STRIPPING, AND GRUBBING	4
31 23 19	DEWATERING	3
31 25 00	EROSION AND SEDIMENTATION CONTROL	5
31 31 16	TERMITE CONTROL	2

DIVISION 32 - EXTERIOR IMPROVMENTS

32 12 16	ASPHALTIC CONCRETE PAVING	8
32 13 00	SITE CONCRETE	7
32 92 00	GRASSING	5
32 93 00	PLANTS	5

DIVISION 33 - UTILITIES

33 11 00	PIPEWORK - WATER DISTRIBUTION SYSTEM	18
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EXHIBIT "A"

23 05 13	MOTORS	2
23 05 29	SUPPORTS AND ANCHORS	9
23 05 48	VIBRATION ISOLATION	6
23 05 93	TESTING, ADJUSTING AND BALANCING	.....	8
23 07 00	MECHANICAL INSULATION	.....	10
23 22 13	CONDENSATE DRAIN PIPING	.....	2
23 31 00	DUCTS	.....	6
23 33 00	DUCTWORK ACCESSORIES	.....	5
23 34 00	POWER VENTILATORS	.....	4
23 37 00	AIR OUTLETS AND INLETS	.....	5
23 81 06	PACKAGED ROOFTOP AIR CONDITIONING UNITS- MEDIUM CAPACITY	.....	8

DIVISION 26 - ELECTRICAL

26 03 05	ELECTRICAL GENERAL REQUIREMENTS	.....	6
26 03 07	MINOR ELECTRICAL DEMOLITION FOR REMODELING	.....	2
26 05 19	WIRE AND CABLE	.....	3
26 05 26	SECONDARY GROUNDING	.....	3
26 05 29	SUPPORTING DEVICES	.....	2
26 05 32	CONDUIT	.....	4
26 05 33	BOXES	.....	3
26 05 34	FLOOR BOXES	.....	2
26 05 53	ELECTRICAL IDENTIFICATION	.....	1
26 24 13	SWITCHBOARDS	.....	5
26 24 16	PANELBOARDS	.....	2
26 24 18	MOTOR CONTROL	.....	3
26 27 16	CABINETS AND ENCLOSURES	.....	2
26 27 26	WIRING DEVICES	.....	2
26 28 19	DISCONNECT SWITCHES	.....	1
26 35 55	TRANSIENT VOLTAGE SURGE SUPPRESSION	.....	8
26 51 00	LIGHTING FIXTURES	.....	2

DIVISION 27- COMMUNICATION CIRCUIT PATHWAYS

27 13 43	COMMUNICATIONS CIRCUIT PATHWAYS	2
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DIVISION 28 - ELECTRIC SAFETY AND SECURITY

28 31 00	FIRE ALARM AND SMOKE DETECTION SYSTEMS	8
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DIVISION 08 - OPENINGS

08 11 13	HOLLOW METAL DOORS AND FRAMES	4
08 14 16	FLUSH WOOD DOORS	4
08 14 33	STILE AND RAIL WOOD DOORS	3
08 43 13	ALUMINUM-FRAMED STOREFRONTS	6
08 71 00	DOOR HARDWARE	12
08 80 00	GLAZING	4

DIVISION 09 - FINISHES

09 21 16	GYPSUM BOARD ASSEMBLIES	7
09 24 00	PORTLAND CEMENT PLASTERING	3
09 30 00	TILING	3
09 51 00	ACOUSTICAL CEILINGS	4
09 65 00	RESILIENT FLOORING	4
09 67 00	FLUID-APPLIED FLOORING	3
09 68 00	CARPETING	3
09 90 00	PAINTING AND COATING	8

DIVISION 10 - SPECIALTIES

10 14 00	SIGNAGE	3
10 21 13.19	PLASTIC TOILET COMPARTMENTS	2
10 26 01	WALL AND CORNER GUARDS	2
10 28 00	TOILET, BATH, AND LAUNDRY ACCESSORIES	4
10 44 00	FIRE PROTECTION SPECIALTIES	2

DIVISION 12 - FURNISHINGS

12 21 13	HORIZONTAL LOUVER BLINDS	2
12 36 00	COUNTERTOPS	3

DIVISION 22 - PLUMBING

22 30 00	PLUMBING	9
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DIVISION 23 - MECHANICAL

23 03 01	BASIC MECHANICAL REQUIRMENTS	19
23 05 03	MECHANICAL IDENTIFICATION	4

EXHIBIT "A"

01 74 19	CONSTRUCTION WASTE MANAGEMENT AND DISPOSAL	.....	3
01 78 00	CLOSEOUT SUBMITTALS	.....	4

DIVISION 02 - EXISTING CONDITIONS

02 06 00	SOIL BORINGS	.....	1
02 41 00	SITE DEMOLITION	.....	3
02 41 01	BUILDING DEMOLITION	4

DIVISION 03 - CONCRETE

03 30 00	CAST-IN-PLACE CONCRETE	8
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DIVISION 04 - MASONRY

04 27 31	REINFORCED UNIT MASONRY	8
04 72 00	CAST STONE MASONRY	4

DIVISION 05 - METALS

05 12 00	STRUCTURAL STEEL FRAMING	.....	5
05 21 00	STEEL JOIST FRAMING	.....	4
05 31 00	STEEL DECKING	.....	4
05 50 00	METAL FABRICATIONS	.....	4
05 52 13	PIPE AND TUBE RAILINGS	.....	3

DIVISION 06 - WOOD, PLASTICS, AND COMPOSITES

06 10 00	ROUGH CARPENTRY	.....	5
06 41 00	ARCHITECTURAL WOOD CASEWORK	.....	4

DIVISION 07 - THERMAL AND MOISTURE PROTECTION

07 11 13	BITUMINOUS DAMPPROOFING	.....	2
07 21 00	THERMAL INSULATION	.....	3
07 52 00	MODIFIED BITUMINOUS MEMBRANE ROOFING	.....	9
07 62 00	SHEET METAL FLASHING AND TRIM	.....	4
07 72 00	ROOF ACCESSORIES	.....	3
07 84 00	FIRESTOPPING	.....	2
07 90 05	JOINT SEALERS	.....	4

TABLE OF CONTENTS

INTRODUCTORY INFORMATION

00 01 01	PROJECT TITLE PAGE	.....	1
00 01 10	TABLE OF CONTENTS	.....	5
	INVITATION TO BID	.....	8
	BID FORM	.....	1
	SWORN STATEMENT ON PUBLIC ENTITY CRIMES	.....	2
	DRUG-FREE WORKPLACE CERTIFICATION	.....	1
	E-VERIFY STATEMENT	.....	1
	STANDARD GENERAL CONDITIONS	.....	42

SUMMARY

01 10 00	SUMMARY	3
----------	---------	-------	---

PRICE AND PAYMENT PROCEDURES

01 20 00	PRICE AND PAYMENT PROCEDURES	3
----------	------------------------------	-------	---

ADMINISTRATIVE REQUIREMENTS

01 30 00	ADMINISTRATIVE REQUIREMENTS	5
----------	-----------------------------	-------	---

QUALITY REQUIREMENTS

01 40 00	QUALITY REQUIREMENTS	4
----------	----------------------	-------	---

TEMPORARY FACILITIES AND CONTROLS

01 50 00	TEMPORARY FACILITIES AND CONTROLS	.....	3
01 58 13	TEMPORARY PROJECT SIGNAGE	.....	2

PRODUCT REQUIREMENTS

01 60 00	PRODUCT REQUIREMENTS	3
----------	----------------------	-------	---

EXECUTION AND CLOSEOUT REQUIREMENTS

01 70 00	EXECUTION AND CLOSEOUT REQUIREMENTS	.....	9
01 71 00	AS-BUILT DRAWINGS	.....	2

SECTION 00 01 01

PROJECT TITLE PAGE

PROJECT MANUAL - CONSTRUCTION DOCUMENTS

NASSAU COUNTY LIBRARY
FERNANDINA BEACH BRANCH
25 NORTH 4TH STREET
FERNANDIA BEACH, FL 32034

EXPANSION AND RENOVATION PROJECT

FOR

THE CITY OF FERNANDINA BEACH, FLORIDA
204 ASH STREET
FERNANDINA BEACH, FLORIDA 32034
VRL PROJECT NO. 1207
JULY 2013

VRL ARCHITECTS, INC.
JACKSONVILLE, FLORIDA

reading. This data has been reviewed and interpretations made in this report. However, it must be noted that fluctuations in the level of the groundwater may occur due to variations in rainfall, temperature, tides, and other factors not evident at the time measurements were made and reported. Since the probability of such variations is anticipated, design drawings and specifications should accommodate such possibilities and construction planning should be based upon such assumptions of variations.

LOCATION OF BURIED OBJECTS

All users of this report are cautioned that there was no requirement for Universal Engineering Sciences to attempt to locate any man-made buried objects during the course of this exploration and that no attempt was made by Universal Engineering Sciences to locate any such buried objects. Universal Engineering Sciences cannot be responsible for any buried man-made objects which are subsequently encountered during construction that are not discussed within the text of this report.

TIME

This report reflects the soil conditions at the time of investigation. If the report is not used in a reasonable amount of time, significant changes to the site may occur and additional reviews may be required.

presented are made by others, those conclusions or recommendations are not the responsibility of Universal Engineering Sciences.

CHANGED STRUCTURE OR LOCATION

This report was prepared in order to aid in the evaluation of this project and to assist the architect or engineer in the design of this project. If any changes in the design or location of the structure as outlined in this report are planned, or if any structures are included or added that are not discussed in the report, the conclusions and recommendations contained in this report shall not be considered valid unless the changes are reviewed and the conclusions modified or approved by Universal Engineering Sciences.

USE OF REPORT BY BIDDERS

Bidders who are examining the report prior to submission of a bid are cautioned that this report was prepared as an aid to the designers of the project and it may affect actual construction operations.

Bidders are urged to make their own soil borings, test pits, test caissons or other investigations to determine those conditions that may affect construction operations. Universal Engineering Sciences cannot be responsible for any interpretations made from this report or the attached boring logs with regard to their adequacy in reflecting subsurface conditions which will affect construction operations.

STRATA CHANGES

Strata changes are indicated by a definite line on the boring logs which accompany this report. However, the actual change in the ground may be more gradual. Where changes occur between soil samples, the location of the change must necessarily be estimated using all available information and may not be shown at the exact depth.

OBSERVATIONS DURING DRILLING

Attempts are made to detect and/or identify occurrences during drilling and sampling, such as: water level, boulders, zones of lost circulation, relative ease or resistance to drilling progress, unusual sample recovery, variation of driving resistance, obstructions, etc.; however, lack of mention does not preclude their presence.

WATER LEVELS

Water level readings have been made in the drill holes during drilling and they indicate normally occurring conditions. Water levels may not have been stabilized at the last

IMPORTANT INFORMATION ABOUT YOUR GEOTECHNICAL ENGINEERING REPORT

More construction problems are caused by site subsurface conditions than any other factor. As troublesome as subsurface problems can be, their frequency and extent have been lessened considerably in recent years, due in large measure to programs and publications of ASFE/ The Association of Engineering Firms Practicing in the Geosciences.

The following suggestions and observations are offered to help you reduce the geotechnical-related delays, cost-overruns and other costly headaches that can occur during a construction project.

A GEOTECHNICAL ENGINEERING REPORT IS BASED ON A UNIQUE SET OF PROJECT-SPECIFIC FACTORS

A geotechnical engineering report is based on a subsurface exploration plan designed to incorporate a unique set of project-specific factors. These typically include: the general nature of the structure involved, its size and configuration; the location of the structure on the site and its orientation; physical concomitants such as access roads, parking lots, and underground utilities, and the level of additional risk which the client assumed by virtue of limitations imposed upon the exploratory program. To help avoid costly problems, consult the geotechnical engineer to determine how any factors which change subsequent to the date of the report may affect its recommendations.

Unless your consulting geotechnical engineer indicates otherwise, *your geotechnical engineering report should not be used:*

- When the nature of the proposed structure is changed, for example, if an office building will be erected instead of a parking garage, or if a refrigerated warehouse will be built instead of an unrefrigerated one;
- when the size or configuration of the proposed structure is altered;
- when the location or orientation of the proposed structure is modified;
- when there is a change of ownership, or
- for application to an adjacent site.

Geotechnical engineers cannot accept responsibility for problems which may develop if they are not consulted after factors considered in their report's development have changed.

MOST GEOTECHNICAL "FINDINGS" ARE PROFESSIONAL ESTIMATES

Site exploration identifies actual subsurface conditions only at those points where samples are taken, when they are taken. Data derived through sampling and subsequent laboratory testing are extrapolated by geo-

technical engineers who then render an opinion about overall subsurface conditions, their likely reaction to proposed construction activity, and appropriate foundation design. Even under optimal circumstances actual conditions may differ from those inferred to exist, because no geotechnical engineer, no matter how qualified, and no subsurface exploration program, no matter how comprehensive, can reveal what is hidden by earth, rock and time. The actual interface between materials may be far more gradual or abrupt than a report indicates. Actual conditions in areas not sampled may differ from predictions. *Nothing can be done to prevent the unanticipated, but steps can be taken to help minimize their impact.* For this reason, *most experienced owners retain their geotechnical consultants through the construction stage, to identify variances, conduct additional tests which may be needed, and to recommend solutions to problems encountered on site.*

SUBSURFACE CONDITIONS CAN CHANGE

Subsurface conditions may be modified by constantly-changing natural forces. Because a geotechnical engineering report is based on conditions which existed at the time of subsurface exploration, *construction decisions should not be based on a geotechnical engineering report whose adequacy may have been affected by time.* Speak with the geotechnical consultant to learn if additional tests are advisable before construction starts.

Construction operations at or adjacent to the site and natural events such as floods, earthquakes or groundwater fluctuations may also affect subsurface conditions and, thus, the continuing adequacy of a geotechnical report. The geotechnical engineer should be kept apprised of any such events, and should be consulted to determine if additional tests are necessary.

GEOTECHNICAL SERVICES ARE PERFORMED FOR SPECIFIC PURPOSES AND PERSONS

Geotechnical engineers' reports are prepared to meet the specific needs of specific individuals. A report prepared for a consulting civil engineer may not be adequate for a construction contractor, or even some other consulting civil engineer. Unless indicated otherwise, this report was prepared expressly for the client involved and expressly for purposes indicated by the client. Use by any other persons for any purpose, or by the client for a different purpose, may result in problems. *No individual other than the client should apply this report for its intended purpose without first conferring with the geotechnical engineer. No person should apply this report for any purpose other than that originally contemplated without first conferring with the geotechnical engineer.*

LIST OF APPENDICES

APPENDIX A

BORING LOCATION PLAN
BORING LOGS
KEY TO BORING LOGS
FIELD EXPLORATION PROCEDURES
LABORATORY TESTING PROCEDURES

APPENDIX B

IMPORTANT INFORMATION ABOUT YOUR GEOTECHNICAL ENGINEERING
REPORT
CONSTRAINTS AND RESTRICTIONS

UNIVERSAL ENGINEERING SCIENCES, INC.

GENERAL CONDITIONSSECTION 1: RESPONSIBILITIES

- 1.1 Universal Engineering Sciences, Inc., heretofore referred to as the "Consultant," has the responsibility for providing the services described under the "Scope of Services" section. The work is to be performed according to accepted standards of care and is to be completed in a timely manner.
- 1.2 The "Client" or a duly authorized representative, is responsible for providing the Consultant with a clear understanding of the project nature and scope. The Client shall supply the Consultant with sufficient and adequate information, including, but not limited to, maps, site plans, reports, surveys and designs, to allow the Consultant to properly complete the specified services. The Client shall also communicate changes in the nature and scope of the project as soon as possible during performance of the work so that the changes can be incorporated into the work product.

SECTION 2: STANDARD OF CARE

- 2.1 Services performed by the Consultant under this Agreement are expected by the Client to be conducted in a manner consistent with the level of care and skill ordinarily exercised by members of the Consultant's profession practicing contemporaneously under similar conditions in the locality of the project. No other warranty, expressed or implied, is made.
- 2.2 The Client recognizes that subsurface conditions may vary from those observed at locations where borings, surveys, or other explorations are made, and that site conditions may change with time. Data, interpretations, and recommendations by the Consultant will be based solely on information available to the Consultant at the time of service. The Consultant is responsible for those data, interpretations, and recommendations, but will not be responsible for other parties' interpretations or use of the information developed.

SECTION 3: SITE ACCESS AND SITE CONDITIONS

- 3.1 Client will grant or obtain free access to the site for all equipment and personnel necessary for the Consultant to perform the work set forth in this Agreement. The Client will notify any and all possessors of the project site that Client has granted Consultant free access to the site. The Consultant will take reasonable precautions to minimize damage to the site, but it is understood by Client that, in the normal course of work, some damage may occur, and the correction of such damage is not part of this Agreement unless so specified in the Proposal.
- 3.2 The Client is responsible for the accuracy of locations for all subterranean structures and utilities. The Consultant will take reasonable precautions to avoid known subterranean structures, and the Client waives any claim against Consultant, and agrees to defend, indemnify, and hold Consultant harmless from any claim or liability for injury or loss, including costs of defense, arising from damage done to subterranean structures and utilities not identified or accurately located. In addition, Client agrees to compensate Consultant for any time spent or expenses incurred by Consultant in defense of any such claim with compensation to be based upon Consultant's prevailing fee schedule and expense reimbursement policy.

SECTION 4: SAMPLE OWNERSHIP AND DISPOSAL

- 4.1 Soil or water samples obtained from the project during performance of the work shall remain the property of the Client.
- 4.2 The Consultant will dispose of or return to Client all remaining soils and rock samples 60 days after submission of report covering those samples. Further storage or transfer of samples can be made at Client's expense upon Client's prior written request.
- 4.3 Samples which are contaminated by petroleum products or other chemical waste will be returned to Client for treatment or disposal, consistent with all appropriate federal, state, or local regulations.

SECTION 5: BILLING AND PAYMENT

- 5.1 Consultant will submit invoices to Client monthly or upon completion of services. Invoices will show charges for different personnel and expense classifications.
- 5.2 Payment is due 30 days after presentation of invoice and is past due 31 days from invoice date. Client agrees to pay a finance charge of one and one-half percent [1-1/2%] per month, or the maximum rate allowed by law, on past due accounts.
- 5.3 If the Consultant incurs any expenses to collect overdue billings on invoices, the sums paid by the Consultant for reasonable attorney's fees, court costs, Consultant's time, Consultant's expenses, and interest will be due and owing by the Client.

SECTION 6: OWNERSHIP OF DOCUMENTS

- 6.1 All reports, boring logs, field data, field notes, laboratory test data, calculations, estimates, and other documents prepared by the Consultant, as instruments of service, shall remain the property of the Consultant.
- 6.2 Client agrees that all reports and other work furnished to the Client or his agents, which is not paid for, will be returned upon demand and will not be used by the Client for any purpose.
- 6.3 The Consultant will retain all pertinent records relating to the services performed for a period of five years following submission of the report, during which period the records will be made available to the Client at all reasonable times.

SECTION 7: DISCOVERY OF UNANTICIPATED HAZARDOUS MATERIALS

- 7.1 Client warrants that a reasonable effort has been made to inform Consultant of known or suspected hazardous materials on or near the project site.

A GEOTECHNICAL ENGINEERING REPORT IS SUBJECT TO MISINTERPRETATION

Costly problems can occur when other design professionals develop their plans based on misinterpretations of a geotechnical engineering report. To help avoid these problems, the geotechnical engineer should be retained to work with other appropriate design professionals to explain relevant geotechnical findings and to review the adequacy of their plans and specifications relative to geotechnical issues.

BORING LOGS SHOULD NOT BE SEPARATED FROM THE ENGINEERING REPORT

Final boring logs are developed by geotechnical engineers based upon their interpretation of field logs (assembled by site personnel) and laboratory evaluation of field samples. Only final boring logs customarily are included in geotechnical engineering reports. *These logs should not under any circumstances be redrawn* for inclusion in architectural or other design drawings, because drafters may commit errors or omissions in the transfer process. Although photographic reproduction eliminates this problem, it does nothing to minimize the possibility of contractors misinterpreting the logs during bid preparation. When this occurs, delays, disputes and unanticipated costs are the all-too-frequent result.

To minimize the likelihood of boring log misinterpretation, *give contractors ready access to the complete geotechnical engineering report* prepared or authorized for their use. Those who do not provide such access may proceed un-

der the *mistaken* impression that simply disclaiming responsibility for the accuracy of subsurface information always insulates them from attendant liability. Providing the best available information to contractors helps prevent costly construction problems and the adversarial attitudes which aggravate them to disproportionate scale.

READ RESPONSIBILITY CLAUSES CLOSELY

Because geotechnical engineering is based extensively on judgment and opinion, it is far less exact than other design disciplines. This situation has resulted in wholly unwarranted claims being lodged against geotechnical consultants. To help prevent this problem, geotechnical engineers have developed model clauses for use in written transmittals. These are *not* exculpatory clauses designed to foist geotechnical engineers' liabilities onto someone else. Rather, they are definitive clauses which identify where geotechnical engineers' responsibilities begin and end. Their use helps all parties involved recognize their individual responsibilities and take appropriate action. Some of these definitive clauses are likely to appear in your geotechnical engineering report, and you are encouraged to read them closely. Your geotechnical engineer will be pleased to give full and frank answers to your questions.

OTHER STEPS YOU CAN TAKE TO REDUCE RISK

Your consulting geotechnical engineer will be pleased to discuss other techniques which can be employed to mitigate risk. In addition, ASFE has developed a variety of materials which may be beneficial. Contact ASFE for a complimentary copy of its publications directory.

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OF ENGINEERING FIRMS
PRACTICING IN THE GEOSCIENCES

8811 Colesville Road/Suite G106/Silver Spring, Maryland 20910/(301) 565-2733

SECTION 02 41 00

SITE DEMOLITION

PART 1 - GENERAL**1.01 DESCRIPTION OF WORK:**

- A. The extent of demolition work is shown on the drawings.
- B. Demolition includes the complete wrecking and removal and disposal of selected structures, walks, paving and other materials as shown on the drawings and specified.
- C. Demolition includes removal and disposal of utility services and appurtenances to such except as otherwise shown or specified.
- D. Trees and plants which are to remain and must be protected are indicated on the drawings. Perform trimming and tree repair work, by a licensed arborist, for damages incurred or anticipated to occur by new construction to the satisfaction of the Engineer.

1.02 SUBMITTALS:

- A. Schedule Demolition: Submit written schedule of methods and operations of demolition to the Architect for approval prior to the start of work. Include in the schedule the coordination for shut-off, capping, street interruption and continuation of utility services as required.
- B. Provide a detailed sequence of demolition and removal work to ensure the uninterrupted progress of the Owner's operations.

1.03 JOB CONDITIONS:

- A. Occupancy: Structures and other items to be demolished will be vacated and discontinued in use immediately prior to the start of demolition work.
- B. Condition of Items to be Demolished: The Owner assumes no responsibility for the actual condition of items to be demolished. Conditions existing at the time of inspection for bidding purposes will be maintained by the Owner insofar as practicable. However, variations within the items may occur by Owner's removal and salvage operations prior to the start of the demolition work. Contractor shall verify in writing to the Engineer, safe conditions prior to the commencement of demolition work.

- 7.2 Under this agreement, the term hazardous materials includes hazardous materials (40 CFR 172.01), hazardous wastes (40 CFR 261.2), hazardous substances (40 CFR 300.6), petroleum products, polychlorinated biphenyls, and asbestos.
- 7.3 Hazardous materials may exist at a site where there is no reason to believe they could or should be present. Consultant and Client agree that the discovery of unanticipated hazardous materials constitutes a changed condition mandating a renegotiation of the scope of work. Consultant and Client also agree that the discovery of unanticipated hazardous materials may make it necessary for Consultant to take immediate measures to protect health and safety. Client agrees to compensate Consultant for any equipment decontamination or other costs incident to the discovery of unanticipated hazardous waste.
- 7.4 Consultant agrees to notify Client when unanticipated hazardous materials or suspected hazardous materials are encountered. Client agrees to make any disclosures required by law to the appropriate governing agencies. Client also agrees to hold Consultant harmless for any and all consequences of disclosures made by Consultant which are required by governing law. In the event the project site is not owned by Client, Client recognizes that it is the Client's responsibility to inform the property owner of the discovery of unanticipated hazardous materials or suspected hazardous materials.
- 7.5 Notwithstanding any other provision of the Agreement, Client waives any claim against Consultant, and to the maximum extent permitted by law, agrees to defend, indemnify, and save Consultant harmless from any claim, liability, and/or defense costs for injury or loss arising from Consultant's discovery of unanticipated hazardous materials or suspected hazardous materials including any costs created by delay of the project and any cost associated with possible reduction of the property's value. Client will be responsible for ultimate disposal of any samples secured by the Consultant which are found to be contaminated.

SECTION 8: RISK ALLOCATION

- 8.1 Client agrees that Consultant's liability for any damage on account of any error, omission or other professional negligence will be limited to a sum not to exceed \$50,000 or Consultant's fee, whichever is greater. If Client prefers to have higher limits on professional liability, Consultant agrees to increase the limits up to a maximum of \$1,000,000 upon Client's written request at the time of accepting our proposal provided that Client agrees to pay an additional consideration of four percent of the total fee, or \$400,00, whichever is greater. The additional charge for the higher liability limits is because of the greater risk assumed and is not strictly a charge for additional professional liability insurance.

SECTION 9: INSURANCE

- 9.1 The Consultant represents and warrants that it and its agents, staff and Consultants employed by it, is and are protected by worker's compensation insurance and that Consultant has such coverage under public liability and property damage insurance policies which the Consultant deems to be adequate. Certificates for all such policies of insurance shall be provided to Client upon request in writing. Within the limits and conditions of such insurance, Consultant agrees to indemnify and save Client harmless from and against loss, damage, or liability arising from negligent acts by Consultant, its agents, staff, and consultants employed by it. The Consultant shall not be responsible for any loss, damage or liability beyond the amounts, limits, and conditions of such insurance or the limits described in Section 8, whichever is less. The Client agrees to defend, indemnify and save consultant harmless for loss, damage or liability arising from acts by client, client's agent, staff, and other consultants employed by Client.

SECTION 10: DISPUTE RESOLUTION

- 10.1 All claims, disputes, and other matters in controversy between Consultant and Client arising out of or in any way related to this Agreement will be submitted to "alternative dispute resolution" (ADR) such as mediation and/or arbitration, before and as a condition precedent to other remedies provided by law.
- 10.2 If a dispute at law arises related to the services provided under this Agreement and that dispute requires litigation instead of ADR as provided above, then:
- the claim will be brought and tried in judicial jurisdiction of the court of the county where Consultant's principal place of business is located and Client waives the right to remove the action to any other county or judicial jurisdiction, and
 - the prevailing party will be entitled to recovery of all reasonable costs incurred, including staff time, court costs, attorney's fees, and other claim related expenses.

SECTION 11: TERMINATION

- 11.1 This agreement may be terminated by either party upon seven (7) days written notice in the event of substantial failure by the other party to perform in accordance with the terms hereof. Such termination shall not be effective if that substantial failure has been remedied before expiration of the period specified in the written notice. In the event of termination, Consultant shall be paid for services performed to the termination notice date plus reasonable termination expenses.
- 11.2 In the event of termination, or suspension for more than three (3) months, prior to completion of all reports contemplated by this Agreement, Consultant may complete such analyses and records as are necessary to complete his files and may also complete a report on the services performed to the date of notice of termination or suspension. The expense of termination or suspension shall include all direct costs of Consultant in completing such analyses, records and reports.

SECTION 12: ASSIGNS

- 12.1 Neither the Client nor the Consultant may delegate, assign, subcontract or transfer his duties or interest in this Agreement without the written consent of the other party.

SECTION 13: GOVERNING LAW AND SURVIVAL

- 13.1 The laws of the State of Florida will govern the validity of these Terms, their interpretation and performance.
- 13.2 If any of the provisions contained in this Agreement are held illegal, invalid, or unenforceable, the enforceability of the remaining provisions will not be impaired. Limitations of liability and indemnities will survive termination of this Agreement for any cause.

- C. Noise Pollution: Comply with all applicable sections of Federal, State, local and OSHA Regulations for noise pollution control, suppression and equipment.
- D. Structure Demolition: Demolish structures completely and remove from the site. Use such methods as required to complete the work within the limitations of governing regulations. Use of explosives is NOT ALLOWED.
- E. Demolish paving (asphaltic or concrete) in small sections. Where new paving abuts, saw cut existing paving to provide straight, clean perimeter for new.
- F. Below-Grade Construction:
 - 1. Demolish and remove below-grade construction and concrete slabs on grade.
 - 2. Filling Basements and Voids: Completely fill below-grade areas and voids resulting within the work area and from the demolition of structures.
 - 3. Use suitable soil materials as specified in Section 310000 - Earthwork.
- G. Disposal of Demolished Materials: Remove from the site debris, rubbish, excess excavations, displaced trees, trimmings and other materials resulting from demolition operations and clearing and grubbing. Burning or disposal of removed materials from demolished structures shall not be permitted on project site. Dispose of material in an approved manner meeting local requirements. Contractor shall pay all expenses including landfill fees associated with the disposal of material.

3.02 PROTECTION OF TREES AND PLANTS:

- A. Protect root systems from damage due to materials in solution caused by run-off or spillage during mixing and placement of construction materials or drainage from stored materials. Protect root systems from flooding, erosion or excessive wetting resulting from dewatering operations.
- B. Repair and Replacement of Trees:
 - 1. Repair trees or plants damaged by construction operations in a manner acceptable to the Engineer. Make repairs promptly after damage occurs to prevent progressive deterioration of damaged trees.

END OF SECTION

EXHIBIT "A"

- C. Protections: Ensure the safe passage of persons around the area of demolition. Conduct operations to prevent injury to adjacent buildings, structures, other facilities and persons.
 - 1. Erect temporary covered passageways to maintain existing fire exits and as otherwise required by authorities having jurisdiction.
 - 2. Provide interior and exterior shoring, bracing, or support to prevent movement or settlement or collapse of structures to be demolished and adjacent facilities to remain.
- D. Damages: Promptly repair damages caused to adjacent facilities by demolition operations at no cost to the Owner.
- E. Utility Services: Maintain existing utilities indicated to remain, keep in service, and protect against damage during demolition operations. Do not interrupt existing utilities serving occupied or used facilities, except when authorized in writing by the Owner. Timely notice shall be given to all parties affected by temporary interruptions to existing utilities, as acceptable to the governing authorities.
- F. Provide temporary fencing, barricades or guards to protect trees and other plants, which are to remain, from damage, in accordance with the City of Fernandina Beach Land Development Code, Chapter 4, Para. 4.05.09.F.

PART 2 - PRODUCTS

(Not Applicable)

PART 3 - EXECUTION

3.01 DEMOLITION:

- A. Pollution Controls: Use water sprinkling, temporary enclosures and other suitable methods to limit the amount of dust and dirt rising and scattering in the air to the lowest practical level. Comply with governing regulations pertaining to environmental protection.
- B. Clean adjacent structures and improvements of dust, dirt and debris caused by demolition operations to the satisfaction of the Engineer or governing authorities. Return adjacent areas to condition existing prior to the start of the work.

- F. Remove manholes and manhole covers, curb inlets and catch basins as required.
- G. Remove fences and gates as required for construction work.
- H. Remove other items indicated, for salvage and relocation.
- I. Fill excavations, open pits, and holes in ground areas generated as result of removals, using specified fill; compact fill as required so that required rough grade elevations do not subside within one year after completion.

3.02 GENERAL PROCEDURES AND PROJECT CONDITIONS

- A. Comply with other requirements specified in Section 01 70 00.
- B. Comply with applicable codes and regulations for demolition operations and safety of adjacent structures and the public.
 - 1. Obtain required permits.
 - 2. Comply with applicable requirements of NFPA 241.
 - 3. Use of explosives is not permitted.
 - 4. Take precautions to prevent catastrophic or uncontrolled collapse of structures to be removed; do not allow worker or public access within range of potential collapse of unstable structures.
 - 5. Provide, erect, and maintain temporary barriers and security devices.
 - 6. Use physical barriers to prevent access to areas that could be hazardous to workers or the public.
 - 7. Conduct operations to minimize effects on and interference with adjacent structures and occupants.
 - 8. Do not close or obstruct roadways or sidewalks without permit.
 - 9. Conduct operations to minimize obstruction of public and private entrances and exits; do not obstruct required exits at any time; protect persons using entrances and exits from removal operations.
 - 10. Obtain written permission from owners of adjacent properties when demolition equipment will traverse, infringe upon or limit access to their property.
- C. Do not begin removal until receipt of notification to proceed from City of Fernandina Beach, Florida.
- D. Do not begin removal until built elements to be salvaged or relocated have been removed.
- E. Do not begin removal until vegetation to be relocated has been removed and specified measures have been taken to protect vegetation to remain.
- F. Protect existing structures and other elements that are not to be removed.
 - 1. Provide bracing and shoring.
 - 2. Prevent movement or settlement of adjacent structures.
 - 3. Stop work immediately if adjacent structures appear to be in danger.
- G. Minimize production of dust due to demolition operations; do not use water if that will result in ice, flooding, sedimentation of public waterways or storm sewers, or other pollution.
- H. If hazardous materials are discovered during removal operations, stop work and notify Architect and City of Fernandina Beach, Florida; hazardous materials include regulated asbestos containing materials, lead, PCB's, and mercury.
- I. Perform demolition in a manner that maximizes salvage and recycling of materials.
 - 1. Comply with requirements of Section 01 74 19 - Waste Management.
 - 2. Dismantle existing construction and separate materials.
 - 3. Set aside reusable, recyclable, and salvageable materials; store and deliver to collection point or point of reuse.

SECTION 02 41 01

BUILDING DEMOLITION

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Building demolition excluding removal of hazardous materials and toxic substances.
- B. Selective demolition of built site elements.
- C. Selective demolition of building elements for alterations purposes.
- D. Abandonment and removal of existing utilities and utility structures.

1.02 REFERENCE STANDARDS

- A. 29 CFR 1926 - U.S. Occupational Safety and Health Standards; current edition.
- B. NFPA 241 - Standard for Safeguarding Construction, Alteration, and Demolition Operations; 2004.

1.03 SUBMITTALS

- A. See Section 01 30 00 - Administrative Requirements, for submittal procedures.
- B. Site Plan: Showing:
 - 1. Vegetation to be protected.
 - 2. Areas for temporary construction and field offices.
 - 3. Areas for temporary and permanent placement of removed materials.
- C. Demolition Plan: Submit demolition plan as specified by OSHA and local authorities.
 - 1. Indicate extent of demolition, removal sequence, bracing and shoring, and location and construction of barricades and fences.
 - 2. Identify demolition firm and submit qualifications.
 - 3. Include a summary of safety procedures.
- D. Project Record Documents: Accurately record actual locations of capped and active utilities and subsurface construction.

1.04 QUALITY ASSURANCE

- A. Demolition Firm Qualifications: Company specializing in the type of work required.
 - 1. Minimum of five years of documented experience.

PART 2 PRODUCTS -- NOT USED

PART 3 EXECUTION

3.01 SCOPE

- A. Remove portions of existing buildings in the following sequence:
- B. Remove paving and curbs as required to accomplish new work.
- C. Within area of new construction, remove foundation walls and footings to a minimum of 2 feet below finished grade.
- D. Outside area of new construction, remove foundation walls and footings to a minimum of 2 feet below finished grade.
- E. Remove concrete slabs on grade as indicated on drawings.

- F. Protect existing work to remain.
 - 1. Prevent movement of structure; provide shoring and bracing if necessary.
 - 2. Perform cutting to accomplish removals neatly and as specified for cutting new work.
 - 3. Repair adjacent construction and finishes damaged during removal work.
 - 4. Patch as specified for patching new work.

3.05 DEBRIS AND WASTE REMOVAL

- A. Remove debris, junk, and trash from site.
- B. Remove from site all materials not to be reused on site; comply with requirements of Section 01 74 19 - Waste Management.
- C. Leave site in clean condition, ready for subsequent work.
- D. Clean up spillage and wind-blown debris from public and private lands.

END OF SECTION

- J. Partial Removal of Paving and Curbs: Neatly saw cut at right angle to surface.

3.03 EXISTING UTILITIES

- A. Coordinate work with utility companies; notify before starting work and comply with their requirements; obtain required permits.
- B. Protect existing utilities to remain from damage.
- C. Do not disrupt public utilities without permit from authority having jurisdiction.
- D. Do not close, shut off, or disrupt existing life safety systems that are in use without at least 7 days prior written notification to City of Fernandina Beach, Florida.
- E. Do not close, shut off, or disrupt existing utility branches or take-offs that are in use without at least 3 days prior written notification to City of Fernandina Beach, Florida.
- F. Locate and mark utilities to remain; mark using highly visible tags or flags, with identification of utility type; protect from damage due to subsequent construction, using substantial barricades if necessary.
- G. Remove exposed piping, valves, meters, equipment, supports, and foundations of disconnected and abandoned utilities.
- H. Prepare building demolition areas by disconnecting and capping utilities outside the demolition zone; identify and mark utilities to be subsequently reconnected, in same manner as other utilities to remain.

3.04 SELECTIVE DEMOLITION FOR ALTERATIONS

- A. Drawings showing existing construction and utilities are based on casual field observation and existing record documents only.
 - 1. Verify that construction and utility arrangements are as shown.
 - 2. Report discrepancies to Architect before disturbing existing installation.
 - 3. Beginning of demolition work constitutes acceptance of existing conditions.
- B. Separate areas in which demolition is being conducted from other areas that are still occupied.
 - 1. Provide, erect, and maintain temporary dustproof partitions of construction specified in Section 01 50 00 in locations indicated on drawings.
- C. Maintain weatherproof exterior building enclosure except for interruptions required for replacement or modifications; take care to prevent water and humidity damage.
- D. Remove existing work as indicated and as required to accomplish new work.
 - 1. Remove rotted wood, corroded metals, and deteriorated masonry and concrete; replace with new construction specified.
 - 2. Remove items indicated on drawings.
- E. Services (Including but not limited to HVAC, Plumbing, Fire Protection, Electrical, Telecommunications, and Data): Remove existing systems and equipment as indicated.
 - 1. Maintain existing active systems that are to remain in operation; maintain access to equipment and operational components.
 - 2. Where existing active systems serve occupied facilities but are to be replaced with new services, maintain existing systems in service until new systems are complete and ready for service.
 - 3. See Section 01 10 00 for other limitations on outages and required notifications.
 - 4. Verify that abandoned services serve only abandoned facilities before removal.
 - 5. Remove abandoned pipe, ducts, conduits, and equipment, including those above accessible ceilings; remove back to source of supply where possible, otherwise cap stub and tag with identification.

Specimens; 2012a.

- N. ASTM C94/C94M - Standard Specification for Ready-Mixed Concrete; 2012.
- O. ASTM C143/C143M - Standard Test Method for Slump of Hydraulic-Cement Concrete; 2010a.
- P. ASTM C150/C150M - Standard Specification for Portland Cement; 2012.
- Q. ASTM C171 - Standard Specification for Sheet Materials for Curing Concrete; 2007.
- R. ASTM C173/C173M - Standard Test Method for Air Content of Freshly Mixed Concrete by the Volumetric Method; 2010b.
- S. ASTM C260 - Standard Specification for Air-Entraining Admixtures for Concrete; 2010a.
- T. ASTM C309 - Standard Specification for Liquid Membrane-Forming Compounds for Curing Concrete; 2011.
- U. ASTM C494/C494M - Standard Specification for Chemical Admixtures for Concrete; 2012.
- V. ASTM C618 - Standard Specification for Coal Fly Ash and Raw or Calcined Natural Pozzolan for Use in Concrete; 2012.
- W. ASTM C685/C685M - Standard Specification for Concrete Made by Volumetric Batching and Continuous Mixing; 2011.
- X. ASTM C881/C881M - Standard Specification for Epoxy-Resin-Base Bonding Systems for Concrete; 2010.
- Y. ASTM C1059/C1059M - Standard Specification for Latex Agents for Bonding Fresh to Hardened Concrete; 1999 (Reapproved 2008).
- Z. ASTM C1107/C1107M - Standard Specification for Packaged Dry, Hydraulic-Cement Grout (Nonshrink); 2011.
- AA. ASTM D994/D994M - Standard Specification for Preformed Expansion Joint Filler for Concrete (Bituminous Type); 2011.
- AB. ASTM D1751 - Standard Specification for Preformed Expansion Joint Filler for Concrete Paving and Structural Construction (Nonextruding and Resilient Bituminous Types); 2004 (Reapproved 2008).
- AC. COE CRD-C 513 - COE Specifications for Rubber Waterstops; Corps of Engineers; 1974.
- AD. COE CRD-C 572 - Corps of Engineers Specifications for Polyvinylchloride Waterstop; Corps of Engineers; 1974.

1.03 SUBMITTALS

- A. See Section 01 30 00 - Administrative Requirements, for submittal procedures.
- B. Product Data: Submit manufacturers' data on manufactured products showing compliance with specified requirements and installation instructions.
- C. Samples: Submit two, 8 inch long samples of construction joint devices.
- D. Manufacturer's Installation Instructions: For concrete accessories, indicate installation procedures and interface required with adjacent construction.
- E. FGBC Submittal: If any fly ash, ground granulated blast furnace slag, silica fume, rice hull ash, or other waste material is used in mix designs to replace Portland cement, submit the total volume of concrete cast in place, mix design(s) used showing the quantity of portland cement replaced, reports showing successful cylinder testing, and temperature on day of pour if cold weather mix is used; use FGBC New Product Content Form.

SECTION 03 30 00

CAST-IN-PLACE CONCRETE

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Concrete formwork.
- B. Concrete building frame members.
- C. Concrete for composite floor construction.
- D. Elevated concrete slabs.
- E. Floors and slabs on grade.
- F. Concrete foundation walls.
- G. Concrete reinforcement.
- H. Joint devices associated with concrete work.
- I. Miscellaneous concrete elements, including equipment pads, light pole bases, flagpole bases, thrust blocks, and manholes.
- J. Concrete curing.

1.02 REFERENCE STANDARDS

- A. ACI 211.1 - Standard Practice for Selecting Proportions for Normal, Heavyweight, and Mass Concrete; American Concrete Institute International; 1991 (Reapproved 2002).
- B. ACI 301 - Specifications for Structural Concrete for Buildings; American Concrete Institute International; 2010.
- C. ACI 302.1R - Guide for Concrete Floor and Slab Construction; American Concrete Institute International; 2004 (Errata 2007).
- D. ACI 304R - Guide for Measuring, Mixing, Transporting, and Placing Concrete; American Concrete Institute International; 2000.
- E. ACI 305R - Hot Weather Concreting; American Concrete Institute International; 2010.
- F. ACI 306R - Cold Weather Concreting; American Concrete Institute International; 2010.
- G. ACI 308R - Guide to Curing Concrete; American Concrete Institute International; 2001 (Reapproved 2008).
- H. ACI 318 - Building Code Requirements for Structural Concrete and Commentary; American Concrete Institute International; 2011.
- I. ASTM A185/A185M - Standard Specification for Steel Welded Wire Reinforcement, Plain, for Concrete; 2007.
- J. ASTM A497/A497M - Standard Specification for Steel Welded Wire Reinforcement, Deformed, for Concrete; 2007.
- K. ASTM A615/A615M - Standard Specification for Deformed and Plain Billet-Steel Bars for Concrete Reinforcement; 2012.
- L. ASTM C33/C33M - Standard Specification for Concrete Aggregates; 2011a.
- M. ASTM C39/C39M - Standard Test Method for Compressive Strength of Cylindrical Concrete

EXHIBIT "A"

- B. Air Entrainment Admixture: ASTM C260.
- C. Air Entrainment Admixture: ASTM C 260.
- D. Chemical Admixtures: ASTM C 494/C 494M, Type A - Water Reducing, Type B - Retarding, Type D - Water Reducing and Retarding, Type F - Water Reducing, High Range, and Type G - Water Reducing, High Range and Retarding.
 - 1. Do not use chemicals that will result in soluble chloride ions in excess of 0.1 percent by weight of cement.

2.05 ACCESSORY MATERIALS

- A. Reglets: Formed steel sheet, galvanized, with temporary filler to prevent concrete intrusion during placement.
- B. Bonding Agent: ASTM C 1059, Type II acrylic non-redispersable type.
- C. Epoxy Bonding System: ASTM C 881, type as required by project conditions.
- D. Vapor Retarder: 6 mil thick fabric reinforced plastic film, type recommended for below grade application.
- E. Chemical Hardener: Fluosilicate solution designed for densification of cured concrete slabs.
- F. Non-Shrink Cementitious Grout: Premixed compound consisting of non-metallic aggregate, cement, water reducing and plasticizing agents.
 - 1. Minimum Compressive Strength at 48 Hours: 2,400 psi.
 - 2. Minimum Compressive Strength at 28 Days: 7,000 psi.
- G. Curing Materials: Comply with requirements of Section 03 39 00.
- H. Moisture-Retaining Cover: ASTM C 171; regular curing paper.
- I. Liquid Curing Compound: ASTM C 309, Type 1, clear or translucent.

2.06 BONDING AND JOINTING PRODUCTS

- A. Slab Isolation Joint Filler: 1/2 inch thick, height equal to slab thickness, with removable top section that will form 1/2 inch deep sealant pocket after removal.
- B. Waterstops: Rubber type, COE CRD-C 513.
- C. Joint Filler: Nonextruding, resilient asphalt impregnated fiberboard, felt, or cork, complying with ASTM D 1751, thickness as indicated on drawings and width/depth as indicated.
- D. Joint Filler: Compressible asphalt mastic with felt facers, complying with ASTM D 994, thickness as indicated on drawings and depth/width as indicated.
- E. Construction Joint Devices: Integral galvanized steel; 4 inch thick, formed to tongue and groove profile, with removable top strip exposing sealant trough, knockout holes spaced at 6 inches, ribbed steel spikes with tongue to fit top screed edge.

2.07 CONCRETE MIX DESIGN

- A. Proportioning Normal Weight Concrete: Comply with ACI 211.1 recommendations.
- B. Concrete Strength: Establish required average strength for concrete on the basis of trial mixtures, as specified in ACI 301.
 - 1. For trial mixtures method, employ independent testing agency acceptable to Architect for preparing and reporting proposed mix designs.
- C. Admixtures: Add acceptable admixtures as recommended in ACI 211.1 and at rates recommended by manufacturer.

- F. Project Record Documents: Accurately record actual locations of embedded utilities and components that will be concealed from view upon completion of concrete work.

1.04 QUALITY ASSURANCE

- A. Perform work of this section in accordance with ACI 301 and ACI 318.
 - 1. Maintain one copy of each document on site.
- B. Acquire cement from same source and aggregate from same source for entire project.
- C. Follow recommendations of ACI 305R when concreting during hot weather.
- D. Follow recommendations of ACI 306R when concreting during cold weather.

PART 2 PRODUCTS

2.01 FORMWORK

- A. Form Materials: Contractor's choice of standard products with sufficient strength to withstand hydrostatic head without distortion in excess of permitted tolerances.
 - 1. Form Facing for Exposed Finish Concrete: Contractor's choice of materials that will provide smooth, stain-free final appearance.
 - 2. Form Coating: Release agent that will not adversely affect concrete or interfere with application of coatings.
 - 3. Form Ties: Cone snap type that will leave no metal within 1-1/2 inches of concrete surface.

2.02 REINFORCEMENT

- A. Comply with requirements of Section 03 20 00.
- B. Reinforcing Steel: ASTM A 615/A 615M Grade 60.
 - 1. Type: Deformed billet-steel bars.
 - 2. Finish: Unfinished, unless otherwise indicated.
- C. Steel Welded Wire Reinforcement: ASTM A 185/A 185M, plain type.
 - 1. Flat Sheets or Coiled Rolls.
 - 2. Mesh Size and Wire Gage: As indicated on drawings.
- D. Reinforcement Accessories:
 - 1. Tie Wire: Annealed, minimum 16 gage.
 - 2. Chairs, Bolsters, Bar Supports, Spacers: Sized and shaped for adequate support of reinforcement during concrete placement.
 - 3. Provide plastic coated steel components for placement within 1-1/2 inches of weathering surfaces.

2.03 CONCRETE MATERIALS

- A. Cement: ASTM C150, Type I - Normal Portland type.
- B. Fine and Coarse Aggregates: ASTM C 33.
- C. Fly Ash: ASTM C618, Class C or F.
- D. Ground Granulated Blast - Furnace Slag = ASTM C989, Grade 100 or 120.
- E. Calcined Pozzolan: ASTM C618, Class N.
- F. Water: Clean and not detrimental to concrete.

2.04 CHEMICAL ADMIXTURES

- A. Do not use chemicals that will result in soluble chloride ions in excess of 0.1 percent by weight of cement.

3.04 PLACING CONCRETE

- A. Place concrete in accordance with ACI 304R.
- B. Place concrete for floor slabs in accordance with ACI 302.1R.
- C. Notify Architect not less than 24 hours prior to commencement of placement operations.
- D. Ensure reinforcement, inserts, waterstops, embedded parts, and formed construction joint devices will not be disturbed during concrete placement.
- E. Finish floors level and flat, unless otherwise indicated, within the tolerances specified below.

3.05 SLAB JOINTING

- A. Locate joints as indicated on the drawings.
- B. Anchor joint fillers and devices to prevent movement during concrete placement.
- C. Isolation Joints: Use preformed joint filler with removable top section for joint sealant, total height equal to thickness of slab, set flush with top of slab.
- D. Repair underslab vapor retarder damaged during placement of concrete reinforcing. Repair with vapor retarder material; lap over damaged areas minimum 6 inches and seal watertight.
- E. Separate slabs on grade from vertical surfaces with joint filler.
- F. Place joint filler in floor slab pattern placement sequence. Set top to required elevations. Secure to resist movement by wet concrete.
- G. Extend joint filler from bottom of slab to within 1/2 inch of finished slab surface. Conform to Section 07 90 05 for finish joint sealer requirements.
- H. Install joint devices in accordance with manufacturer's instructions.
- I. Install construction joint devices in coordination with floor slab pattern placement sequence. Set top to required elevations. Secure to resist movement by wet concrete.
- J. Install joint device anchors for expansion joint assemblies specified in Section 07 95 13. Maintain correct position to allow joint cover to be flush with floor finish.
- K. Apply sealants in joint devices in accordance with Section 07 90 05.
- L. Maintain records of concrete placement. Record date, location, quantity, air temperature, and test samples taken.
- M. Place concrete continuously between predetermined expansion, control, and construction joints.
- N. Do not interrupt successive placement; do not permit cold joints to occur.
- O. Place floor slabs in saw cut pattern indicated.
- P. Saw cut joints within 8 hours after placing. Use 3/16 inch thick blade, cut into 1/4 depth of slab thickness.
- Q. Screed floors and slabs on grade level, maintaining surface flatness of maximum 1/4 inch in 10 ft.

3.06 FLOOR FLATNESS AND LEVELNESS TOLERANCES

- A. Maximum Variation of Surface Flatness:
 - 1. Exposed Concrete Floors: 1/4 inch in 10 ft.
 - 2. Under Seamless Resilient Flooring: 1/4 inch in 10 ft.
 - 3. Under Carpeting: 1/4 inch in 10 ft.

D. Normal Weight Concrete:

1. Compressive Strength, when tested in accordance with ASTM C 39/C 39M at 28 days: See plan.
2. Fly Ash Content: Maximum 25 percent of cementitious materials by weight.
3. Calcined Pozzolan Content: Maximum 10 percent of cementitious materials by weight.
4. Ground Granulated Blast - Furnace Slag = Maximum 50% of cementitious materials by weight.
5. Cement Content: Minimum 470 lb per cubic yard.
6. Water-Cement Ratio: Maximum 0.5 percent by weight.
7. Total Air Content: 3 percent, determined in accordance with ASTM C173/C173M.
8. Maximum Aggregate Size: 3/4 inch.
9. Slag Content: Maximum 50 percent of cementitious materials by weight.

2.08 MIXING

- A. On Project Site: Mix in drum type batch mixer, complying with ASTM C685. Mix each batch not less than 1-1/2 minutes and not more than 5 minutes.
- B. Transit Mixers: Comply with ASTM C94/C94M.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Verify lines, levels, and dimensions before proceeding with work of this section.

3.02 PREPARATION

- A. Formwork: Comply with requirements of ACI 301. Design and fabricate forms to support all applied loads until concrete is cured, and for easy removal without damage to concrete.
- B. Verify that forms are clean and free of rust before applying release agent.
- C. Coordinate placement of embedded items with erection of concrete formwork and placement of form accessories.
- D. Where new concrete is to be bonded to previously placed concrete, prepare existing surface by cleaning with steel brush and applying bonding agent in accordance with manufacturer's instructions.
- E. In locations where new concrete is doweled to existing work, drill holes in existing concrete, insert steel dowels and pack solid with non-shrink grout.
- F. Interior Slabs on Grade: Install vapor retarder under interior slabs on grade. Lap joints minimum 6 inches. Seal joints, seams and penetrations watertight with manufacturer's recommended products and follow manufacturer's written instructions. Repair damaged vapor retarder before covering.

3.03 INSTALLING REINFORCEMENT AND OTHER EMBEDDED ITEMS

- A. Comply with requirements of ACI 301. Clean reinforcement of loose rust and mill scale, and accurately position, support, and secure in place to achieve not less than minimum concrete coverage required for protection. Reinforcing steel shall be free of kinks and non-shop bends. Field bends shall be approved by the architect. See ACI 318.05, section 7.3.2.
- B. Install welded wire reinforcement in maximum possible lengths, and offset end laps in both directions. Splice laps with tie wire.
- C. Verify that anchors, seats, plates, reinforcement and other items to be cast into concrete are accurately placed, positioned securely, and will not interfere with concrete placement.

- B. Correct the slab surface if tolerances are less than specified.
- C. Correct defects by grinding or by removal and replacement of the defective work. Areas requiring corrective work will be identified. Re-measure corrected areas by the same process.

3.07 CONCRETE FINISHING

- A. Repair surface defects, including tie holes, immediately after removing formwork.
- B. Unexposed Form Finish: Rub down or chip off fins or other raised areas 1/4 inch or more in height.
- C. Exposed Form Finish: Rub down or chip off and smooth fins or other raised areas 1/4 inch or more in height. Provide finish as follows:
 - 1. Smooth Rubbed Finish: Wet concrete and rub with carborundum brick or other abrasive, not more than 24 hours after form removal.
- D. Concrete Slabs: Finish to requirements of ACI 302.1R, and as follows:
 - 1. Surfaces to Receive Thick Floor Coverings: "Wood float" as described in ACI 302.1R; thick floor coverings include quarry tile, ceramic tile, and terrazzo with full bed setting system.
 - 2. Surfaces to Receive Thin Floor Coverings: "Steel trowel" as described in ACI 301.1R; thin floor coverings include carpeting, resilient flooring, seamless flooring, thin set quarry tile, and thin set ceramic tile.
 - 3. Other Surfaces to Be Left Exposed: "Steel trowel" as described in ACI 302.1R, minimizing burnish marks and other appearance defects.
 - a. Chemical Hardener: After slab has cured, apply water-diluted hardener in three coats per manufacturer's instructions, allowing 24 hours between coats.
- E. In areas with floor drains, maintain floor elevation at walls; pitch surfaces uniformly to drains as indicated on drawings.

3.08 CURING AND PROTECTION

- A. Comply with requirements of ACI 308R. Immediately after placement, protect concrete from premature drying, excessively hot or cold temperatures, and mechanical injury.
- B. Maintain concrete with minimal moisture loss at relatively constant temperature for period necessary for hydration of cement and hardening of concrete.
 - 1. Normal concrete: Not less than 7 days.
 - 2. High early strength concrete: Not less than 4 days.
- C. Formed Surfaces: Cure by moist curing with forms in place for full curing period.
- D. Surfaces Not in Contact with Forms:
 - 1. Initial Curing: Start as soon as free water has disappeared and before surface is dry. Keep continuously moist for not less than three days by water ponding, water-saturated sand, water-fog spray, or saturated burlap.
 - 2. Final Curing: Begin after initial curing but before surface is dry.
 - a. Moisture-Retaining Cover: Seal in place with waterproof tape or adhesive.
 - b. Curing Compound: Apply in two coats at right angles, using application rate recommended by manufacturer.

3.09 FIELD QUALITY CONTROL

- A. Two concrete test cylinders are to be broken at 28 days and the average value used as the test result. FBC 1905.6.1.4.
- B. Provide for concrete cylinder testing, which shall include:
 - 1. FBC sections 1905.1.3 (28-day tests), 1905.6.1.4 (average of two cylinder tests at 28 days).

EXHIBIT "A"

2. The criteria for acceptance of concrete cylinder tests per FBC section 1905.6.2.3.
- C. Slump for regular concrete subject to vibratory compaction should be 4" plus/minus 1", see ACI 301-96, section 4.2.2.2; also ACI A-117, section 2.5.1. For filled cells in reinforced masonry, suggest 8" to 11" slump, see ACI 530.1-99, section 2.6B2.
- D. When air temperature is between 85 and 90 degrees F., reduce mixing and delivery time to 75 minutes. When air temperature is higher than 90 degrees, reduce mixing and delivery time to 60 minutes.
- E. Concrete should be deposited as nearly as practicable to its final position to avoid segregation of materials due to re-handling or flowing. FBC section 1906.4.1.
- F. Concreting should be carried on at such a rate that the concrete is at all times plastic and flows readily into spaces between reinforcement. FBC section 1906.4.2.
- G. Prohibit the following concrete, FBC sections 1906.4.3, 1906.4.4:
 1. Partially hardened concrete.
 2. Contaminated concrete.
 3. Re-tempered concrete.
 4. Concrete that has be re-mixed after it has taken its initial set.
- H. After concreting has been started, it should be carried on as a continuous operation until placing of a panel or section, as determined by its boundaries or joints, is completed. FBC section 1906.4.5.
- I. Construction joints should be per FBC sections 1907.4.1 and 1907.4.2 (cleaned, laitance removed, wetted, standing water removed).
- J. All concrete should be thoroughly consolidated by suitable means during placement and should be worked around reinforcement and embedded fixtures and into corners of forms. FBC section 1906.4.8.
- K. Suggest a concrete wet cure time of 7 days minimum at 50 degrees minimum temperature. ACI 318-99, Section 5.11.1, also FBC section 1906.5.1.
- L. Finishing tolerance for concrete floor slabs which receive resilient coverings should be 1/8" in 10 feet. ACI 301, sections 11.8.2, 11.7.3, 11.9.1.

3.10 DEFECTIVE CONCRETE

- A. Test Results: The testing agency shall report test results in writing to Architect and Contractor within 24 hours of test.
- B. Defective Concrete: Concrete not conforming to required lines, details, dimensions, tolerances or specified requirements.
- C. Repair or replacement of defective concrete will be determined by the Architect. The cost of additional testing shall be borne by Contractor when defective concrete is identified.
- D. Do not patch, fill, touch-up, repair, or replace exposed concrete except upon express direction of Architect for each individual area.

END OF SECTION

SECTION 04 27 31

REINFORCED UNIT MASONRY

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Concrete Block. (CMU)
- B. Brick Cleaning
- C. Clay Facing Brick.(BR)
- D. Mortar and Grout.
- E. Reinforcement and Anchorage.
- F. Flashings.
- G. Lintels.
- H. Accessories.

1.02 REFERENCE STANDARDS

- A. ACI 530/530.1/ERTA - Building Code Requirements and Specification for Masonry Structures and Related Commentaries; American Concrete Institute International; 2011.
- B. ACI 530.1/ASCE 6/TMS 602 - Specification For Masonry Structures; American Concrete Institute International; 2008.
- C. ASTM A82/A82M - Standard Specification for Steel Wire, Plain, for Concrete Reinforcement; 2007.
- D. ASTM A153/A153M - Standard Specification for Zinc Coating (Hot-Dip) on Iron and Steel Hardware; 2009.
- E. ASTM A653/A653M - Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process; 2011.
- F. ASTM C67 - Standard Test Methods for Sampling and Testing Brick and Structural Clay Tile; 2012.
- G. ASTM C90 - Standard Specification for Loadbearing Concrete Masonry Units; 2012.
- H. ASTM C91/C91M - Standard Specification for Masonry Cement; 2012.
- I. ASTM C94/C94M - Standard Specification for Ready-Mixed Concrete; 2012.
- J. ASTM C140 - Standard Test Methods of Sampling and Testing Concrete Masonry Units and Related Units; 2012.
- K. ASTM C216 - Standard Specification for Facing Brick (Solid Masonry Units Made From Clay or Shale); 2012.
- L. ASTM C270 - Standard Specification for Mortar for Unit Masonry; 2012.
- M. ASTM C404 - Standard Specification for Aggregates for Masonry Grout; 2011.
- N. ASTM C476 - Standard Specification for Grout for Masonry; 2010.
- O. ASTM C780 - Standard Test Method for Preconstruction and Construction Evaluation of Mortars for Plain and Reinforced Unit Masonry; 2012.

- P. ASTM C979/C979M - Standard Specification for Pigments for Integrally Colored Concrete; 2010.
- Q. ASTM C1019 - Standard Test Method for Sampling and Testing Grout; 2011.
- R. ASTM C1142 - Standard Specification for Extended Life Mortar for Unit Masonry; 1995 (Reapproved 2007).
- S. ASTM C1314 - Standard Test Method for Compressive Strength of Masonry Prisms; 2011a.
- T. UL (FRD) - Fire Resistance Directory; Underwriters Laboratories Inc.; current edition.

1.03 SUBMITTALS

- A. See Section 01 30 00 - Administrative Requirements, for submittal procedures.
- B. Product Data: Provide data for masonry units, fabricated wire reinforcement, and mortar and grout, brick cleaning product.
- C. Shop Drawings: Indicate bar sizes, spacings, reinforcement quantities, bending and cutting schedules, reinforcement supporting and spacing devices, and accessories.
- D. Samples: Submit four samples of facing brick and cast stone units to illustrate color, texture, and extremes of color range.
- E. Design Data: Indicate required mortar strength, unit assembly strength in each plane, and supporting test data.
- F. Manufacturer's Certificate: Certify that masonry units meet or exceed specified requirements.

1.04 QUALITY ASSURANCE

- A. Comply with provisions of ACI 530/530.1/ERTA, except where exceeded by requirements of the contract documents.

1.05 REGULATORY REQUIREMENTS

- A. Conform to applicable code for UL Assembly No. U905 or U906 for 1 and 2 Hour masonry walls.

1.06 MOCK-UP

- A. Construct a masonry wall as a mock-up panel sized 8 feet long by 6 feet high; include mortar and accessories, structural backup, reinforcement, grout, and each type of masonry unit in mock-up.
- B. Locate where directed.
- C. Mock-up may remain as part of the Work.

1.07 PRE-INSTALLATION MEETING

- A. Convene an on site meeting before starting brick cleaning with architect, contractor, brick cleaner, and brick manufacturer representative to perform brick test area work of this section.

1.08 DELIVERY, STORAGE, AND HANDLING

- A. Deliver, handle, and store masonry units by means that will prevent mechanical damage and contamination by other materials.

1.09 FIELD CONDITIONS

- A. Maintain materials and surrounding air temperature to minimum 40 degrees F prior to, during, and 48 hours after completion of masonry work.
- B. Maintain materials and surrounding air temperature to maximum 90 degrees F prior to, during, and 48 hours after completion of masonry work.

1.10 EXTRA MATERIALS

- A. See Section 01 60 00 - Product Requirements, for additional provisions.
- B. Provide 50 of each size, color, and type of face brick units for City of Fernandina Beach, Florida's use in maintenance of project.

PART 2 PRODUCTS**2.01 CONCRETE MASONRY UNITS (CMU)**

- A. Concrete Block (CMU): Comply with referenced standards and as follows:
 - 1. Size: Standard units with nominal face dimensions of 16 x 8 inches and nominal depths as indicated on the drawings for specific locations.
 - 2. Special Shapes: Provide non-standard blocks configured for bull-nosed ends and corners.
 - 3. Load-Bearing Units: ASTM C90, normal weight.
 - a. Hollow block, as indicated.

2.02 BRICK UNITS (BR)

- A. Manufacturers:
 - 1. Acceptable: the following Manufacturer's are acceptable, if they can provide bricks closely matching the Design Basis:
 - a. Cherokee Brick and Tile Co., Acme Brick, Nominal size.
 - b. Carolina Ceramics Brick Company.
 - c. Taylor Clay Products, Inc., Wire Cut and Nominal size, www.taylorclay.com
 - d. Boral Bricks, IncNone - : www.boralbricks.com.
 - e. Endicott Clay Products CoNone - : www.endicott.com
 - f. General Shale Brick - : www.generalshale.com.
 - 2. Design Basis: See Exterior Material and Color Legend on Drawing Sheet No. A-604 for Brick specific colors, texture, and size intended for the project.
 - 3. Substitutions: See section 01 60 00 - Product requirements.
- B. Facing Brick: ASTM C216, Type FBS, Grade SW.
 - 1. Color and texture: Match different bricks indicated on Drawing Sheet No. A-604.
 - 2. Nominal size: As indicated on drawings.
 - 3. Special shapes: Molded units as required by conditions indicated, unless standard units can be sawn to produce equivalent effect.

2.03 MORTAR AND GROUT MATERIALS

- A. Masonry Cement: ASTM C91/C91M Type N.
 - 1. Colored mortar: Premixed cement as required to match Architect's color sample.
- B. Water: Clean and potable.

2.04 REINFORCEMENT AND ANCHORAGE

- A. Manufacturers of Joint Reinforcement and Anchors:
 - 1. Dur-O-Wal: www.dur-o-wal.com.
 - 2. Heckmann Building Products, Inc: www.heckmannbuildingprods.com.
 - 3. Hohmann & Barnard, Inc (including Dur-O-Wal brand): www.h-b.com.
 - 4. WIRE-BOND: www.wirebond.com.
 - 5. Substitutions: See Section 01 60 00 - Product Requirements.
- B. Reinforcing Steel: Type specified in Section 03 20 00; size as indicated on drawings; uncoated finish.
- C. Single Wythe Joint Reinforcement: Truss type; ASTM A 82/A 82M steel wire, hot dip galvanized after fabrication to ASTM A 153/A 153M, Class B; 0.1483 inch side rods with 0.1483 inch cross

rods; width as required to provide not more than 1 inch and not less than 1/2 inch of mortar coverage on each exposure.

- D. Adjustable Multiple Wythe Joint Reinforcement: Truss type with adjustable ties or tabs spaced at 16 in on center ASTM A 82/A 82M steel wire, hot dip galvanized after fabrication to ASTM A 153/A 153M, Class B; 0.1875 inch side rods with 0.1483 inch cross rods and adjustable components of 0.1875 inch wire; width of components as required to provide not more than 1 inch and not less than 1/2 inch of mortar coverage from each masonry face.
 - 1. Vertical adjustment: Not less than 2 inches.
- E. Strap Anchors: Bent steel shapes configured as required for specific situations, 1-1/4 in width, 0.105 in thick, lengths as required to provide not more than 1 inch and not less than 1/2 inch of mortar coverage from masonry face, corrugated for embedment in masonry joint, hot dip galvanized to ASTM A 153/A 153M, Class B.
- F. Wall Ties: Corrugated formed sheet metal, 7/8 inch wide by 0.05 inch thick, hot dip galvanized to ASTM A 153/A 153M, Class B, sized to provide not more than 1 inch and not less than 1/2 inch of mortar coverage from masonry face.
- G. Two-Piece Wall Ties: Formed steel wire, 0.1875 inch thick, adjustable, eye and pintle type, hot dip galvanized to ASTM A 153/A 153M, Class B, sized to provide not more than 1 inch and not less than 1/2 inch of mortar coverage from masonry face and to allow vertical adjustment of up to 1-1/4 in.

2.05 FLASHINGS

- A. Copper/Kraft Paper Flashings: 3 oz/sq ft sheet copper bonded to fiber reinforced asphalt treated-Kraft paper.
- B. Lap Sealant: Butyl type as specified in Section 07 90 05.

2.06 ACCESSORIES

- A. Preformed Control Joints: Rubber material. Provide with corner and tee accessories, fused joints.
- B. Joint Filler: Closed cell polyvinyl chloride; oversized 50 percent to joint width; self expanding; 1 inch wide x by maximum lengths available.
- C. Cleaning Solution: Non-acidic, Vanitrol Masonry Cleaner, not harmful to masonry work or adjacent materials.

2.07 LINTELS

- A. Precast Concrete Lintels: See Structural. Only permitted where concealed from view.

2.08 MORTAR MIXES

- A. Ready Mixed Mortar: ASTM C1142, Type RM.
- B. Mortar for Unit Masonry: ASTM C270, using the Proportion Specification.
 - 1. Engineered masonry: Type M.
 - 2. Masonry below grade and in contact with earth: Type S.
 - 3. Exterior, loadbearing masonry: Type N.
 - 4. Interior, loadbearing masonry: Type N.

2.09 MORTAR MIXING

- A. Thoroughly mix mortar ingredients using mechanical batch mixer, in accordance with ASTM C270 and in quantities needed for immediate use.
- B. Maintain sand uniformly damp immediately before the mixing process.

- C. Do not use anti-freeze compounds to lower the freezing point of mortar.
- D. If water is lost by evaporation, re-temper only within two hours of mixing.
- E. Use mortar within two hours after mixing at temperatures of 90 degrees F, or two-and-one-half hours at temperatures under 40 degrees F.

2.10 GROUT MIXES

- A. Bond Beams and Lintels: 3,000 psi strength at 28 days; 8-10 inches slump; provide premixed type in accordance with ASTM C 94/C 94M.
 - 1. Fine grout for spaces with smallest horizontal dimension of 2 inches or less.
 - 2. Coarse grout for spaces with smallest horizontal dimension greater than 2 inches.
- B. Engineered Masonry: 3,000 psi strength at 28 days; 8-10 inches slump; provide premixed type in accordance with ASTM C 94/C 94M.
 - 1. Fine grout for spaces with smallest horizontal dimension of 2 inches or less.
 - 2. Coarse grout for spaces with smallest horizontal dimension greater than 2 inches.

2.11 GROUT MIXING

- A. Mix grout in accordance with ASTM C94/C94M.

2.12 PRECONSTRUCTION TESTING

- A. Testing will be conducted by an independent test agency, in accordance with provisions of Section 01 40 00.
- B. Clay Masonry: Test each type of clay masonry in accordance with ASTM C67.
- C. Concrete Masonry: Test each type, class, and grade of concrete masonry unit in accordance with ASTM C140 for conformance to requirements of this specification.
- D. Mortar Mixes: Test mortars prebatched by weight in accordance with ASTM C780 recommendations for preconstruction testing.
- E. Grout Mixes: Test grout batches in accordance with ASTM C1019 procedures.
- F. Compressive Strength: Where indicated, test masonry prisms in accordance with ASTM C1314.
 - 1. Prepare two sets of prisms; test one set at 7 days and the other at 28 days.
 - 2. Clay masonry prisms: Height-to-thickness ration of 5.0.
 - 3. Concrete masonry prisms: Height-to-thickness ratio of not less than 1.33 and not more than 5.0; apply correction factor per ACI 530/530.1/ERTA for ratio other than 2.0.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Verify that field conditions are acceptable and are ready to receive masonry.
- B. Verify that related items provided under other sections are properly sized and located.
- C. Verify that built-in items are in proper location, and ready for roughing into masonry work.

3.02 PREPARATION

- A. Direct and coordinate placement of metal anchors supplied for installation under other sections.
- B. Clean reinforcement of loose rust.
- C. Provide temporary bracing during installation of masonry work. Maintain in place until building structure provides permanent bracing.
- D. For areas where high-lift grouting will be employed, provide cleanout openings as follows:

1. Brick Masonry: Not less than 8 inches on center at the bottom of one wythe, formed by omitting bricks.
2. Hollow Masonry: Not less than 8 inches high at the bottom of each cell to be grouted, formed by cutting out face shell of masonry unit.

3.03 COURSING

- A. Establish lines, levels, and coursing indicated. Protect from displacement.
- B. Maintain masonry courses to uniform dimension. Form vertical and horizontal joints of uniform thickness.
- C. Concrete Masonry Units: CMU and ACMU
 1. Bond: Running.
 2. Coursing: One unit and one mortar joint to equal 8 inches or 4 inches to match existing coursing.
 3. Mortar Joints: Concave, tool horizontal joints, flush vertical joints.
- D. Brick Units:
 1. Bond: 1/2 Bond.
 2. Coursing: Three units and three mortar joints to equal 8 inches.
 3. Mortar Joints: Concave.

3.04 PLACING AND BONDING

- A. Lay solid masonry units in full bed of mortar, with full head joints, uniformly jointed with other work.
- B. Place Cast Stone units as indicated on drawings.
- C. Remove excess mortar as work progresses.
- D. Interlock intersections and external corners, except for units laid in stack bond.
- E. Do not shift or tap masonry units after mortar has achieved initial set. Where adjustment must be made, remove mortar and replace.
- F. Perform job site cutting of masonry units with proper tools to provide straight, clean, unchipped edges. Prevent broken masonry unit corners or edges.
- G. Cut mortar joints flush where wall tile is scheduled or resilient base is scheduled.

3.05 REINFORCEMENT AND ANCHORAGE

- A. Reinforcement Bars: Secure at locations indicated and to avoid displacement during grouting. Minimum spacing between bars or to masonry surfaces shall be one bar diameter.
- B. Joint Reinforcement: Install horizontal joint reinforcement 16 inches on center vertically except where indicated otherwise.
 1. Place masonry joint reinforcement in first and second horizontal joints above and below openings. Extend minimum 24 inches each side of opening.
 2. Place continuous joint reinforcement in first and second joint below top of walls.
 3. Lap joint reinforcement ends minimum 6 inches.
- C. Anchors: Reinforce stack bonded unit joint comers and intersections with strap anchors 16 inches on center.
- D. Anchors: Fasten anchors to structural framing and embed in masonry joints as masonry is laid. Unless otherwise indicated on drawings or closer spacing is indicated under specific wall type, space anchors at maximum of 36 inches horizontally and 24 inches vertically.
- E. Wall Ties: Install wall ties at locations indicated, spaced at not more than 24 inches on center

horizontally and 16 inches on center vertically, unless otherwise indicated on drawings.

- F. Reinforced Hollow Unit Masonry: Keep vertical cores to be grouted clear of mortar, including bed area of first course.
 1. Bond Beams: At bond beams or other locations for horizontally reinforced masonry, provide special masonry units or saw to accommodate reinforcement.

3.06 MASONRY FLASHINGS

- A. Whether or not specifically indicated, install masonry flashing to divert water to exterior at all locations where downward flow of water will be interrupted.
 1. Extend flashings full width at such interruptions and at least 4 inches into adjacent masonry or turn up at least 4 inches to form watertight pan at non-masonry construction.
 2. Remove or cover protrusions or sharp edges that could puncture flashings.
 3. Seal lapped ends and penetrations of flashing before covering with mortar.
- B. Extend laminated flashings to within 1/4 inch of exterior face of masonry.
- C. Lap end joints of flashings at least 4 inches and seal watertight with mastic or elastic sealant.

3.07 GROUTING

- A. Use either high-lift or low-lift grouting techniques, at Contractor's option, subject to other limitations of contract documents.
- B. Low-Lift Grouting:
 1. Limit height of pours to 48 inches.
 2. Limit height of masonry to 40 inches above each pour.
 3. Pour grout only after vertical reinforcing is in place; place horizontal reinforcing as grout is poured. Prevent displacement of bars as grout is poured.
 4. Place grout for each pour continuously and consolidate immediately; do not interrupt pours for more than 1-1/2 hours.
- C. High-Lift Grouting:
 1. Verify that horizontal and vertical reinforcement is in proper position and adequately secured before beginning pours.
 2. Clean out masonry cells and other cavities to be grouted by high pressure water spray or compressed air. Remove debris, allow to dry, and inspect before sealing cleanout openings.
 3. Hollow Masonry: Limit lifts to maximum 4 feet and pours to maximum height of 24 feet.
 4. Place grout for spanning elements in single, continuous pour.

3.08 CONTROL AND EXPANSION JOINTS

- A. Do not continue horizontal joint reinforcement through control and expansion joints.
- B. Install preformed control joint device in continuous lengths. Seal butt and corner joints in accordance with manufacturer's instructions.
- C. Size control joint in accordance with Section 07 90 05 for sealant performance.
- D. Form expansion joint as detailed.

3.09 BUILT-IN WORK

- A. As work progresses, install built-in metal door frames and other items to be built into the work and furnished under other sections.
- B. Install built-in items plumb, level, and true to line.
- C. Bed anchors of metal door and glazed frames in adjacent mortar joints. Fill frame voids solid

with grout.

1. Fill adjacent masonry cores with grout minimum 12 inches from framed openings.

3.10 TOLERANCES

- A. Maximum Variation From Unit to Adjacent Unit: 1/16 inch.
- B. Maximum Variation from Plane of Wall: 1/4 inch in 10 ft and 1/2 inch in 20 ft or more.
- C. Maximum Variation from Plumb: 1/4 inch per story non-cumulative; 1/2 inch in two stories or more.
- D. Maximum Variation from Level Coursing: 1/8 inch in 3 ft and 1/4 inch in 10 ft; 1/2 inch in 30 ft.
- E. Maximum Variation of Joint Thickness: 1/8 inch in 3 ft.
- F. Maximum Variation from Cross Sectional Thickness of Walls: 1/4 inch.

3.11 CUTTING AND FITTING

- A. Cut and fit for chases. Coordinate with other sections of work to provide correct size, shape, and location.
- B. Obtain approval prior to cutting or fitting masonry work not indicated or where appearance or strength of masonry work may be impaired.

3.12 CLEANING

- A. Test Clean a sample 100 SF area for Architect's approval prior to continuing cleaning work.
- B. Remove excess mortar and mortar smears as work progresses.
- C. Replace defective mortar. Match adjacent work.
- D. Clean soiled surfaces with cleaning solution as recommended by the manufacturer.
- E. Use non-metallic tools in cleaning operations.

END OF SECTION

SECTION 04 72 00

CAST STONE MASONRY

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Architectural cast stone.
- B. Units required are:
 - 1. Window Sills
 - 2. Splash Blocks

1.02 REFERENCE STANDARDS

- A. ACI 318 - Building Code Requirements for Structural Concrete and Commentary; American Concrete Institute International; 2011.
- B. ASTM A123/A123M - Standard Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products; 2012.
- C. ASTM A185/A185M - Standard Specification for Steel Welded Wire Reinforcement, Plain, for Concrete; 2007.
- D. ASTM A615/A615M - Standard Specification for Deformed and Plain Billet-Steel Bars for Concrete Reinforcement; 2012.
- E. ASTM C33/C33M - Standard Specification for Concrete Aggregates; 2011a.
- F. ASTM C150/C150M - Standard Specification for Portland Cement; 2012.
- G. ASTM C270 - Standard Specification for Mortar for Unit Masonry; 2012.
- H. ASTM C494/C494M - Standard Specification for Chemical Admixtures for Concrete; 2012.
- I. ASTM C1364 - Standard Specification for Architectural Cast Stone; 2010b.

1.03 SUBMITTALS

- A. See Section 01 30 00 - Administrative Requirements, for submittal procedures.
- B. Product Data: Test results of cast stone components made previously by the manufacturer.
- C. Shop Drawings: Include elevations, dimensions, layouts, profiles, cross sections, reinforcement, exposed faces, arrangement of joints, anchoring methods, anchors, and piece numbers.
- D. Mortar Color Selection Samples.
- E. Verification Samples: Pieces of actual cast stone components not less than 6 inches square, illustrating range of color and texture to be anticipated in components furnished for the project.

1.04 QUALITY ASSURANCE

- A. Mock-Up: Provide full size cast stone components for installation in mock-up of exterior wall.
 - 1. Approved mock-up will become standard for appearance and workmanship.
 - 2. Mock-up may remain as part of the completed work.
 - 3. Remove mock-up not incorporated into the work and dispose of debris.

1.05 DELIVERY, STORAGE, AND HANDLING

- A. Deliver cast stone components secured to shipping pallets and protected from damage and discoloration. Protect corners from damage.

- B. Number each piece individually to match shop drawings and schedule.
- C. Store cast stone components and installation materials in accordance with manufacturer's instructions.
- D. Store cast stone components on pallets with nonstaining, waterproof covers. Ventilate under covers to prevent condensation. Prevent contact with dirt.
- E. Protect cast stone components during handling and installation to prevent chipping, cracking, or other damage.
- F. Store mortar materials where contamination can be avoided.
- G. Schedule and coordinate production and delivery of cast stone components with unit masonry work to optimize on-site inventory and to avoid delaying the work.

PART 2 PRODUCTS

2.01 MANUFACTURERS

- A. Architectural Cast Stone:
 - 1. Any current producer member of the Cast Stone Institute.

2.02 ARCHITECTURAL CAST STONE

- A. Cast Stone: Architectural concrete product manufactured to simulate appearance of natural limestone, complying with ASTM C1364.
 - 1. Compressive Strength: As specified in ASTM C1364; calculate strength of pieces to be field cut at 80 percent of uncut piece.
 - 2. Freeze-Thaw Resistance: Demonstrated by field experience.
 - 3. Surface Texture: Fine grained texture, with no bugholes, air voids, or other surface blemishes visible from distance of 20 feet.
 - 4. Color: Selected by Architect from manufacturer's full range.
 - 5. Remove cement film from exposed surfaces before packaging for shipment.
- B. Shapes: Provide shapes indicated on drawings.
 - 1. Variation from Any Dimension, Including Bow, Camber, and Twist: Maximum of plus/minus 1/8 inch or length divided by 360, whichever is greater, but not more than 1/4 inch.
 - 2. Unless otherwise indicated on drawings, provide:
 - a. Wash or slope of 1:12 on exterior horizontal surfaces.
 - b. Drips on projecting components, wherever possible.
 - c. Raised fillets at back of sills and at ends to be built in.
- C. Reinforcement: Provide reinforcement as required to withstand handling and structural stresses; comply with ACI 318.
 - 1. Pieces More than 24 inches in Any Dimension: Provide full length two-way reinforcement of cross-sectional area not less than 0.25 percent of unit cross-sectional area.

2.03 MATERIALS

- A. Portland Cement: ASTM C150.
 - 1. For Units: Type I or II, white.
 - 2. For Mortar: Type I or II, except Type III may be used in cold weather.
- B. Coarse Aggregate: ASTM C33, except for gradation; granite, quartz, or limestone.
- C. Fine Aggregate: ASTM C33, except for gradation; natural or manufactured sands.
- D. Admixtures: ASTM C494/C494M.
- E. Water: Potable.

EXHIBIT "A"

- F. Reinforcing Bars: ASTM A615/A615M deformed bars, galvanized or epoxy coated.
- G. Steel Welded Wire Reinforcement: ASTM A185/A185M, galvanized or epoxy coated.
- H. Embedded Anchors, Dowels, and Inserts: Type 304 stainless steel, of type and size as required for conditions.
- I. Shelf Angles and Similar Structural Items: Hot-dip galvanized steel per ASTM A123/A123M, of shapes and sizes as required for conditions.
- J. Mortar: Portland cement-lime, ASTM C270, Type N; do not use masonry cement.
- K. Sealant: As specified in Section 07 90 05.
- L. Cleaner: General-purpose cleaner designed for removing mortar and grout stains, efflorescence, and other construction stains from new masonry surfaces without discoloring or damaging masonry surfaces; approved for intended use by cast stone manufacturer and by cleaner manufacturer for use on cast stone and adjacent masonry materials.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Examine construction to receive cast stone components. Notify Architect if construction is not acceptable.
- B. Do not begin installation until unacceptable conditions have been corrected.

3.02 INSTALLATION

- A. Install cast stone components in conjunction with masonry, complying with requirements of Section 04 20 00.
- B. Mechanically anchor cast stone units indicated; set remainder in mortar.
- C. Setting:
 - 1. Drench cast stone components with clear, running water immediately before installation.
 - 2. Set units in a full bed of mortar unless otherwise indicated.
 - 3. Fill vertical joints with mortar.
 - 4. Fill dowel holes and anchor slots completely with mortar or non-shrink grout.
- D. Joints: Make all joints 3/8 inch, except as otherwise detailed.
 - 1. Rake mortar joints 3/4 inch for pointing.
 - 2. Remove excess mortar from face of stone before pointing joints.
 - 3. Point joints with mortar in layers 3/8 inch thick and tool to a slight concave profile.
 - 4. Leave the following joints open for sealant:
 - a. Head joints in top courses, including copings, parapets, cornices, sills, and steps.
 - b. Joints in projecting units.
 - c. Joints below ledge and relieving angles.
 - d. Joints labeled "expansion joint".
- E. Sealant Joints: Install sealants as specified in Section 07 90 05.
- F. Installation Tolerances:
 - 1. Variation from Plumb: Not more than 1/8 inch in 10 feet or 1/4 inch in 20 feet or more.
 - 2. Variation from Level: Not more than 1/8 inch in 10 feet or 1/4 inch in 20 feet, or 3/8 inch maximum.
 - 3. Variation in Joint Width: Not more than 1/8 inch in 36 inches or 1/4 of nominal joint width, whichever is less.
 - 4. Variation in Plane Between Adjacent Surfaces (Lipping): Not more than 1/16 inch difference between planes of adjacent units or adjacent surfaces indicated to be flush with

units.

- G. Repairs: Repair chips and other surface damage noticeable when viewed in direct daylight at 20 feet.
 - 1. Repair with matching touchup material provided by the manufacturer and in accordance with manufacturer's instructions.
 - 2. Repair methods and results subject to Architect 's approval.

3.03 CLEANING

- A. Repair chips and other surface damage noticeable when viewed in direct daylight at 20 feet.
 - 1. Repair with matching touchup material provided by the manufacturer and in accordance with manufacturer's instructions.
 - 2. Repair methods and results subject to Architect 's approval.
- B. Keep cast stone components clean as work progresses.

3.04 PROTECTION

- A. Protect completed work from damage.
- B. Clean, repair, or restore damaged or mortar-splashed work to condition of new work.

END OF SECTION

SECTION 05 12 00

STRUCTURAL STEEL FRAMING

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Structural steel framing members, and support members, suspension cables, sag rods, and struts.
- B. Base plates shear stud connectors.
- C. Grouting under base plates.

1.02 REFERENCE STANDARDS

- A. AISC (MAN) - Steel Construction Manual; American Institute of Steel Construction, Inc.; 2005.
- B. AISC S303 - Code of Standard Practice for Steel Buildings and Bridges; American Institute of Steel Construction, Inc.; 2005.
- C. AISC S348 - Specification for Structural Joints Using ASTM A325 or A490 Bolts; 2004.
- D. ASTM A36/A36M - Standard Specification for Carbon Structural Steel; 2008.
- E. ASTM A53/A53M - Standard Specification for Pipe, Steel, Black and Hot-Dipped, Zinc-Coated, Welded and Seamless; 2012.
- F. ASTM A108 - Standard Specification for Steel Bar, Carbon and Alloy, Cold Finished; 2007.
- G. ASTM A123/A123M - Standard Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products; 2012.
- H. ASTM A153/A153M - Standard Specification for Zinc Coating (Hot-Dip) on Iron and Steel Hardware; 2009.
- I. ASTM A242/A242M - Standard Specification for High-Strength Low-Alloy Structural Steel; 2004 (Reapproved 2009).
- J. ASTM A307 - Standard Specification for Carbon Steel Bolts and Studs, 60 000 PSI Tensile Strength; 2010.
- K. ASTM A325 - Standard Specification for Structural Bolts, Steel, Heat Treated, 120/105 ksi Minimum Tensile Strength; 2010.
- L. ASTM A325M - Standard Specification for Structural Bolts, Steel, Heat Treated 830 MPa Tensile Strength (Metric); 2009.
- M. ASTM A449 - Standard Specification for Hex Cap Screws, Bolts and Studs, Steel, Heat Treated, 120/105/90 ksi Minimum Tensile Strength, General Use; 2010.
- N. ASTM A490 - Standard Specification for Structural Bolts, Alloy Steel, Heat-Treated, 150 ksi Minimum Tensile Strength; 2012.
- O. ASTM A490M - Standard Specification for High-Strength Steel Bolts, Classes 10.9 and 10.9.3, for Structural Steel Joints (Metric); 2012.
- P. ASTM A500/A500M - Standard Specification for Cold-Formed Welded and Seamless Carbon Steel Structural Tubing in Rounds and Shapes; 2010a.
- Q. ASTM A501 - Standard Specification for Hot-Formed Welded and Seamless Carbon Steel Structural Tubing; 2007.

- R. ASTM A514/A514M - Standard Specification for High-Yield Strength, Quenched and Tempered Alloy Steel Plate, Suitable for Welding; 2005 (Reapproved 2009).
- S. ASTM A529/A529M - Standard Specification for High-Strength Carbon-Manganese Steel of Structural Quality; 2005 (Reapproved 2009).
- T. ASTM A563 - Standard Specification for Carbon and Alloy Steel Nuts; 2007a.
- U. ASTM A572/A572M - Standard Specification for High-Strength Low-Alloy Columbium-Vanadium Structural Steel; 2012.
- V. ASTM A588/A588M - Standard Specification for High-Strength Low-Alloy Structural Steel with 50 ksi (345 MPa) Minimum Yield Point with Atmospheric Corrosion Resistance; 2010.
- W. ASTM A992/A992M - Standard Specification for Structural Steel Shapes; 2011.
- X. ASTM A1008/A1008M - Standard Specification for Steel, Sheet, Cold-Rolled, Carbon, Structural, High-Strength, Low Alloy, and High-Strength Low-Alloy with Improved Formability, Solution Hardened, and Bake Hardenable; 2012.
- Y. ASTM A1011/A1011M - Standard Specification for Steel, Sheet and Strip, Hot-Rolled, Carbon, Structural, High-Strength Low-Alloy, High-Strength Low-Alloy with Improved Formability; 2012a.
- Z. ASTM C1107/C1107M - Standard Specification for Packaged Dry, Hydraulic-Cement Grout (Nonsink); 2011.
- AA. ASTM E94 - Standard Guide for Radiographic Examination; 2004-(Reapproved 2010).
- AB. ASTM E164 - Standard Practice for Ultrasonic Contact Examination of Weldments; 2008.
- AC. ASTM E165 - Standard Test Method for Liquid Penetrant Examination for General Industry; 2012.
- AD. ASTM E709 - Standard Guide for Magnetic Particle Testing; 2008.
- AE. ASTM F436 - Standard Specification for Hardened Steel Washers; 2011.
- AF. ASTM F959 - Standard Specification for Compressible-Washer-Type Direct Tension Indicators for Use with Structural Fasteners; 2009.
- AG. AWS A2.4 - Standard Symbols for Welding, Brazing, and Nondestructive Examination; American Welding Society; 2012.
- AH. AWS D1.1/D1.1M - Structural Welding Code - Steel; American Welding Society; 2010.
- AI. ITS (DIR) - Directory of Listed Products; Intertek Testing Services NA, Inc.; current edition.
- AJ. SSPC-Paint 15 - Steel Joist Shop Primer; Society for Protective Coatings; 1999 (Ed. 2004).
- AK. SSPC-Paint 20 - Zinc-Rich Primers (Type I, "Inorganic," and Type II, "Organic"); Society for Protective Coatings; 2002 (Ed. 2004).
- AL. UL (FRD) - Fire Resistance Directory; Underwriters Laboratories Inc.; current edition.

1.03 SUBMITTALS

- A. See Section 01 30 00 - Administrative Requirements, for submittal procedures.
- B. Shop Drawings:
 1. Indicate profiles, sizes, spacing, locations of structural members, openings, attachments, and fasteners.
 2. Connections.
 3. Indicate welded connections with AWS A2.4 welding symbols. Indicate net weld lengths.
- C. Manufacturer's Mill Certificate: Certify that products meet or exceed specified requirements.

EXHIBIT "A"

- D. Mill Test Reports: Indicate structural strength, destructive test analysis and non-destructive test analysis.
- E. Welders Certificates: Certify welders employed on the Work, verifying AWS qualification within the previous 12 months.

1.04 QUALITY ASSURANCE

- A. Fabricate structural steel members in accordance with AISC "Steel Construction Manual."
- B. Comply with Section 10 of AISC "Code of Standard Practice for Steel Buildings and Bridges" for architecturally exposed structural steel.
- C. Maintain one copy of each document on site.
- D. Fabricator: Company specializing in performing the work of this section with minimum 5 years of documented experience.
- E. Erector: Company specializing in performing the work of this section with minimum 5 years of documented experience.
- F. Design connections not detailed on the drawings under direct supervision of a Professional Structural Engineer experienced in design of this work and licensed in Fernandina Beach, Florida.
- G. Structural steel shop drawings shall be signed, sealed, and dated by a registered professional engineer licensed in the State of Florida.

1.05 REGULATORY REQUIREMENTS

- A. Conform to UL Assembly Design No. D929 at beams where indicated and columns in rated partitions.

PART 2 PRODUCTS

2.01 MATERIALS

- A. Steel Angles, Plates, and Channels: ASTM A36/A36M.
- B. Steel W Shapes and Tees: ASTM A992/A992M.
- C. Rolled Steel Structural Shapes: ASTM A992/A992M.
- D. Shear Stud Connectors: Made from ASTM A 108 Grade 1015 bars.
- E. High-Strength Bolts, Nuts, and Washers: ASTM A 325 (ASTM A 325M), Type 1, medium carbon, plain; 1 medium carbon, galvanized.
- F. Cold Formed Structural Tubing: ASTM A500, Grade B.
- G. Headed Anchor Rods: ASTM A 307, Grade C.
- H. High-Strength Anchor Bolts: ASTM A 325, Type 1 medium carbon, plain; ASTM A 325, Type 1 medium carbon, galvanized.
- I. Load Indicator Washers: Provide washers complying with ASTM F959 at all connections requiring high-strength bolts.
- J. Welding Materials: AWS D1.1; type required for materials being welded.
- K. Grout: Non-shrink, non-metallic aggregate type, complying with ASTM C1107/C1107M and capable of developing a minimum compressive strength of 7,000 psi at 28 days.
- L. Shop and Touch-Up Primer: Fabricator's standard, complying with VOC limitations of authorities

having jurisdiction. Shop coat to be minimum of 0.8 mil thick.

- M. Touch-Up Primer for Galvanized Surfaces: Fabricator's standard, complying with VOC limitations of authorities having jurisdiction.

2.02 FABRICATION

- A. Shop fabricate to greatest extent possible.
- B. Continuously seal joined members by continuous welds. Grind exposed welds smooth.
- C. Fabricate connections for bolt, nut, and washer connectors.
- D. Develop required camber for members.

2.03 FINISH

- A. Shop prime structural steel members protected from exterior exposure. Do not prime surfaces that will be fireproofed, field welded, in contact with concrete, or high strength bolted shop coat shall be 1 mil. minimum.
- B. Galvanize exterior exposed structural steel members to comply with ASTM A123/A123M. Provide minimum 1.7 oz./sq. ft. galvanized coating.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Verify that conditions are appropriate for erection of structural steel and that the work may properly proceed.

3.02 ERECTION

- A. Erect structural steel in compliance with AISC "Code of Standard Practice for Steel Buildings and Bridges".
- B. Allow for erection loads, and provide sufficient temporary bracing to maintain structure in safe condition, plumb, and in true alignment until completion of erection and installation of permanent bracing.
- C. Field weld components indicated on drawings.
- D. Use carbon steel bolts only for temporary bracing during construction, unless otherwise specifically permitted on drawings. Install high-strength bolts in accordance with AISC "Specification for Structural Joints Using ASTM A325 or A490 Bolts".
- E. Do not field cut or alter structural members without approval of Architect.
- F. After erection, prime welds, abrasions, and surfaces not shop primed or galvanized, except surfaces to be in contact with concrete.
- G. Grout solidly between column plates and bearing surfaces, complying with manufacturer's instructions for nonshrink grout. Trowel grouted surfaces smooth, splaying neatly to 45 degrees.

3.03 TOLERANCES

- A. Maximum Variation From Plumb: 1/4 inch per story, non-cumulative.
- B. Maximum Offset From True Alignment: 1/4 inch.

3.04 FIELD QUALITY CONTROL

- A. An independent testing agency will perform field quality control tests, as specified in Section 01 40 00.

EXHIBIT "A"

- B. High-Strength Bolts: Provide testing and verification of field-bolted connections in accordance with AISC "Specification for Structural Joints Using ASTM A325 or A490 Bolts", testing at least 50 percent of bolts at each connection.
- C. Welded Connections: Visually inspect all field-welded connections and test at least 10 percent of welds using the following:
 - 1. Radiographic testing performed in accordance with ASTM E94.
 - 2. Ultrasonic testing performed in accordance with ASTM E164.
 - 3. Liquid penetrant inspection performed in accordance with ASTM E165.
 - 4. Magnetic particle inspection performed in accordance with ASTM E709.

END OF SECTION

SECTION 05 21 00

STEEL JOIST FRAMING

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Open web steel joists and shear stud connectors, with bridging, attached seats and anchors.
- B. Loose bearing members, such as plates or angles, and anchor bolts for site placement.
- C. Supplementary framing for roof openings greater than 18 inches.

1.02 REFERENCE STANDARDS

- A. AISC S348 - Specification for Structural Joints Using ASTM A325 or A490 Bolts; 2004.
- B. ASTM A36/A36M - Standard Specification for Carbon Structural Steel; 2008.
- C. ASTM A108 - Standard Specification for Steel Bar, Carbon and Alloy, Cold Finished; 2007.
- D. ASTM A123/A123M - Standard Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products; 2012.
- E. ASTM A153/A153M - Standard Specification for Zinc Coating (Hot-Dip) on Iron and Steel Hardware; 2009.
- F. ASTM A307 - Standard Specification for Carbon Steel Bolts and Studs, 60 000 PSI Tensile Strength; 2010.
- G. ASTM A325 - Standard Specification for Structural Bolts, Steel, Heat Treated, 120/105 ksi Minimum Tensile Strength; 2010.
- H. ASTM A325M - Standard Specification for Structural Bolts, Steel, Heat Treated 830 MPa Tensile Strength (Metric); 2009.
- I. ASTM A490 - Standard Specification for Structural Bolts, Alloy Steel, Heat Treated, 150 ksi Minimum Tensile Strength; 2012.
- J. ASTM A490M - Standard Specification for High-Strength Steel Bolts, Classes 10.9 and 10.9.3, for Structural Steel Joints (Metric); 2012.
- K. ASTM E94 - Standard Guide for Radiographic Examination; 2004 (Reapproved 2010).
- L. ASTM E164 - Standard Practice for Contact Ultrasonic Testing of Weldments; 2008.
- M. ASTM E165 - Standard Test Method for Liquid Penetrant Examination for General Industry; 2012.
- N. ASTM E709 - Standard Guide for Magnetic Particle Testing; 2008.
- O. AWS D1.1/D1.1M - Structural Welding Code - Steel; American Welding Society; 2010.
- P. FMP7825 - Approval Guide; Factory Mutual Research Corporation; current edition.
- Q. ITS (DIR) - Directory of Listed Products; Intertek Testing Services NA, Inc.; current edition.
- R. SJI (SPEC) - Catalog of Standard Specifications and Load Tables for Steel Joists and Joist Girders; Steel Joist Institute; 2011.
- S. SJI Technical Digest No. 9 - Handling and Erection of Steel Joists and Joist Girders; Steel Joist Institute; 2008.
- T. SSPC-Paint 15 - Steel Joist Shop Primer; Society for Protective Coatings; 1999 (Ed. 2004).

EXHIBIT "A"

- U. SSPC-Paint 20 - Zinc-Rich Primers (Type I, "Inorganic," and Type II, "Organic"); Society for Protective Coatings; 2002 (Ed. 2004).
- V. SSPC-Paint 25 - Zinc Oxide, Alkyd, Linseed Oil Primer for Use Over Hand Cleaned Steel, Type I and Type II; Society for Protective Coatings; 1997 (Ed. 2004).
- W. SSPC-SP 2 - Hand Tool Cleaning; Society for Protective Coatings; 1982 (Ed. 2004).
- X. SSPC-SP 3 - Power Tool Cleaning; Society for Protective Coatings; 1982 (Ed. 2004).
- Y. UL (FRD) - Fire Resistance Directory; Underwriters Laboratories Inc.; current edition.

1.03 SUBMITTALS

- A. See Section 01 30 00 - Administrative Requirements, for submittal procedures.
- B. Shop Drawings: Indicate standard designations, joist coding, configurations, sizes, spacings, cambers, locations of joists, joist leg extensions, bridging, connections, attachments, and provide signed and sealed shop drawings.
- C. The Joist Manufacturer shall provide signed and sealed calculations verifying joists and bridging are designed for wind uplift as specified in drawings.
- D. Welders' Certificates: Submit manufacturer's certificates, certifying welders employed on the Work, verifying AWS qualification within the previous 12 months. By an Engineer registered in the State of Florida.

1.04 QUALITY ASSURANCE

- A. Design connections not detailed on the drawings under direct supervision of a Professional Structural Engineer experienced in design of this work and licensed in Fernandina Beach, Florida.
- B. Perform Work, including that for headers and other supplementary framing, in accordance with SJI Standard Specifications Load Tables and SJI Technical Digest No.9.
 - 1. Maintain one copy of each document on site.
- C. Design and Installation Requirements: Conform to UL; FM; or ITS (Warnock Hersey).
- D. Manufacturer Qualifications: Company specializing in performing the work of this section with minimum 5 years documented experience.
- E. Erector Qualifications: Company specializing in performing the work of this section with minimum 5 years documented experience.

1.05 DELIVERY, STORAGE, AND HANDLING

- A. Transport, handle, store, and protect products to SJI requirements.

PART 2 PRODUCTS

2.01 MANUFACTURERS

- A. Steel Joists:
 - 1. Canam Group Inc: www.canam-steeljoists.ws
 - 2. CMC Joist: www.cmcjoist.com
 - 3. Nucor-Vulcraft Group: www.vulcraft.com.

2.02 MATERIALS

- A. Open Web Joists: SJI Type K Joists; or Types indicated on drawings:
 - 1. Provide top chord extensions as indicated.
 - 2. End bearing of 2-1/2 inches on steel supports.

3. End bearing of 4 inches on masonry supports.
 4. Finish: Shop primed.
- B. Anchor Bolts, Nuts and Washers: ASTM A 307, plain.
 - C. Structural Steel For Supplementary Framing and Joist Leg Extensions: ASTM A 36/A 36M.
 - D. Welding Materials: AWS D1.1; type required for materials being welded.
 - E. Shop and Touch-Up Primer: SSPC-Paint 25, zinc oxide, complying with VOC limitations of authorities having jurisdiction.
 - F. Touch-Up Primer for Galvanized Surfaces: SSPC-Paint 20, Type I - Inorganic, complying with VOC limitations of authorities having jurisdiction.

2.03 FABRICATION

- A. Frame special sized openings in joist web framing as detailed.

2.04 FINISH

- A. Galvanize joists as specified.
 1. Do not prime surfaces that will be field welded.
 2. Galvanize steel ledge angles.
- B. Prepare surfaces to be finished in accordance with SSPC-SP 2.
- C. Galvanizing: Provide minimum 1.7 oz/sq ft galvanized coating to ASTM A123/A123M requirements.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Verify existing conditions prior to beginning work.

3.02 ERECTION

- A. Erect joists with correct bearing on supports.
- B. Allow for erection loads. Provide sufficient temporary bracing to maintain framing safe, plumb, and in true alignment.
- C. Coordinate the placement of anchors for securing loose bearing members furnished as part of the work of this section.
- D. After joist alignment and installation of framing, field weld joist seats to steel bearing surfaces.
- E. Coordinate placement of anchors in concrete and masonry construction for securing bearing plates and angles.
- F. After joist alignment and installation of framing, field weld joist seats to bearing plates and angles.
- G. Position and field weld joist chord extensions and wall attachments.
- H. Install supplementary framing for roof openings greater than 18 inches.
- I. Do not permit erection of decking until joists are braced bridged, and secured or until completion of erection and installation of permanent bridging and bracing.
- J. Do not field cut or alter structural members without approval of joist manufacturer.
- K. After erection, prime welds, damaged shop primer, damaged galvanizing, and surfaces not shop primed, except surfaces specified not to be primed.

3.03 TOLERANCES

- A. Maximum Variation From Plumb: 1/4 inch.
- B. Maximum Offset From True Alignment: 1/4 inch.

3.04 FIELD QUALITY CONTROL

- A. An independent testing agency will perform field quality control tests, as specified in Section 01 40 00.
- B. High-Strength Bolts: Provide testing and verification of field-bolted connections in accordance with AISC "Specification for Structural Joints Using ASTM A325 or A490 Bolts", testing at least 10 percent of bolts at each connection.
- C. Welded Connections: Visually inspect all field-welded connections and test at least 10 percent of welds using one of the following:
 - 1. Radiographic testing performed in accordance with ASTM E94.
 - 2. Ultrasonic testing performed in accordance with ASTM E164.
 - 3. Liquid penetrant inspection performed in accordance with ASTM E165.
 - 4. Magnetic particle inspection performed in accordance with ASTM E709.

END OF SECTION

SECTION 05 31 00

STEEL DECKING

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Roof deck.
- B. Supplementary framing for openings up to and including 18 inches.
- C. Bearing plates and angles.

1.02 RELATED REQUIREMENTS

- A. Section 05 12 00 - Structural Steel Framing: Support framing for openings larger than 18 inches.
- B. Section 05 21 00 - Steel Joist Framing: Support framing for openings larger than 18 inches.
- C. Reinforcement pans with drain hub assemblies.

1.03 REFERENCE STANDARDS

- A. ASTM A36/A36M - Standard Specification for Carbon Structural Steel; 2008.
- B. ASTM A108 - Standard Specification for Steel Bar, Carbon and Alloy, Cold-Finished; 2007.
- C. ASTM A123/A123M - Standard Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products; 2012.
- D. ASTM A653/A653M - Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process; 2011.
- E. ASTM A1008/A1008M - Standard Specification for Steel, Sheet, Cold-Rolled, Carbon, Structural, High-Strength, Low Alloy, and High-Strength Low-Alloy with Improved Formability, Solution Hardened, and Bake Hardened; 2012
- F. AWS D1.1/D1.1M - Structural Welding Code - Steel; American Welding Society; 2010.
- G. AWS D1.3 - Structural Welding Code - Sheet Steel; American Welding Society; 2008.
- H. FM P7825 - Approval Guide; Factory Mutual Research Corporation; current edition.
- I. ITS (DIR) - Directory of Listed Products; Intertek Testing Services NA, Inc.; current edition.
- J. SDI (DM) - Publication No.31, Design Manual for Composite Decks, Form Decks, Roof Decks; Steel Deck Institute; 2007.
- K. SSPC-Paint 15 - Steel Joist Shop Primer; The Society for Protective Coatings; 1999 (Ed. 2004).
- L. SSPC-Paint 20 - Zinc-Rich Primers (Type I, "Inorganic," and Type II, "Organic"); The Society for Protective Coatings; 2002 (Ed. 2004).
- M. SSPC-Paint 25 - Zinc Oxide, Alkyd, Linseed Oil Primer for Use Over Hand Cleaned Steel, Type I and Type II; Society for Protective Coatings; 1997 (Ed. 2004).
- N. UL (FRD) - Fire Resistance Directory; Underwriters Laboratories Inc.; current edition.

1.04 PERFORMANCE REQUIREMENTS

- A. Select and design metal deck in accordance with SDI Design Manual.
- B. Calculate to structural working stress design.
- C. Maximum Vertical Deflection of Roof Deck: 1/240.

EXHIBIT "A"

- D. Maximum Lateral Deflection of Diaphragms: 1/500 of the height of the wall.

1.05 SUBMITTALS

- A. See Section 01 30 00 - Administrative Requirements, for submittals procedures.
- B. Shop Drawings: Indicate deck plan, support locations, projections, openings, pertinent details, and accessories.
- C. Product Data: Provide deck profile characteristics, dimensions, structural properties, and finishes.
- D. Certificates: Certify that products furnished meet or exceed specified requirements.
- E. Submit manufacturer's installation instructions.
- F. Welders Certificates: Certify welders employed on the Work, verifying AWS qualification within the previous 12 months.

1.06 QUALITY ASSURANCE

- A. Design deck layout, spans, fastening, and joints under direct supervision of a Professional Structural Engineer experienced in design of this work and licensed in Fernandina Beach, Florida. Provide signed and sealed shop drawings.
- B. Installer Qualifications: Company specializing in performing the work of this Section with minimum 5 years of experience or approved by manufacturer.

1.07 DELIVERY, STORAGE, AND HANDLING

- A. Cut plastic wrap to encourage ventilation.
- B. Store deck on dry wood sleepers; slope for positive drainage.

PART 2 PRODUCTS

2.01 MANUFACTURERS

- A. Steel Deck:
 - 1. Canam Steel Corporation: www.canam-steeljoists.ws.
 - 2. Nucor-Vulcraft Group: www.vulcraft.com.
 - 3. Wheeling Corrugating Co: www.wheelingcorrugating.com.
 - 4. Substitutions: See Section 01 60 00 - Product Requirements.

2.02 STEEL DECK

- A. All Deck Types: Select and design metal deck in accordance with SDI Design Manual.
 - 1. Calculate to structural working stress design and structural properties specified.
- B. Roof Deck: Non-composite type, fluted steel sheet:
 - 1. Galvanized Steel Sheet: ASTM A653/A653M, Structural Steel (SS), with G60/Z180 galvanized coating.
 - a. Grade as required to meet performance criteria.
 - 2. Ungalvanized Steel Sheet: ASTM A1008/A1008M, Designation SS.
 - a. Grade as required to meet performance criteria.
 - 3. Primer: Shop coat of manufacturer's standard primer paint over cleaned and phosphatized substrate. At exposed areas only.
 - 4. Structural Properties:
 - a. Section modulus: As noted on plan.
 - b. Span Design: Multiple.
 - 5. Minimum Metal Thickness, Excluding Finish: As noted.
 - 6. Nominal Height: 1-1/2 inch as noted.

7. Profile: Fluted; SDI WR.
8. Formed Sheet Width: 36 inch.
9. Side Joints: Lapped, welded or lapped, mechanically fastened.
10. End Joints: Lapped, welded.
11. Fire Resistance Classification: Comply with UL; FM Assembly Number D929.

2.03 ACCESSORY MATERIALS

- A. Bearing Plates and Angles: ASTM A 36/A 36M steel, unfinished or galvanized per ASTM A 123/A 123M.
- B. Welding Materials: AWS D1.1.
- C. Fasteners: Galvanized hardened steel, self tapping.
- D. Weld Washers: Mild steel, uncoated, 3/4 inch outside diameter, 1/8 inch thick.
- E. Shop and Touch-Up Primer: SSPC-Paint 25, zinc oxide, complying with VOC limitations of authorities having jurisdiction.
- F. Touch-Up Primer for Galvanized Surfaces: SSPC-Paint 20, complying with VOC limitations of authorities having jurisdiction.

2.04 FABRICATED DECK ACCESSORIES

- A. Sheet Metal Deck Accessories: Metal cover plates, 22 gage thick sheet steel; of profile and size; galvanized.
- B. Cant Strips: Formed sheet steel, 22 gage thick, 45 degree slope, 3 1/2 inch nominal width and height, flange for attachment.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Verify existing conditions prior to beginning work.

3.02 INSTALLATION

- A. Erect metal deck in accordance with SDI Design Manual and manufacturer's instructions. Align and level.
- B. On concrete and masonry surfaces provide minimum 4 inch bearing.
- C. On steel supports provide minimum 1-1/2 inch bearing.
- D. Fasten deck to steel support members at ends and intermediate supports as noted on plan using methods indicated on drawings.
 1. Welding: Use fusion welds through weld washers.
 2. Place and secure special deep fluted sections for integral concrete bridging.
- E. Weld deck in accordance with AWS D1.3.
- F. At roof deck openings from 6 inches to 18 inches in size, provide steel angle reinforcement. Place angles perpendicular to flutes; extend minimum two flutes beyond each side of opening and mechanically attach to deck at each flute.
- G. Where roof deck changes direction, install 6 inch minimum wide sheet steel cover plates, of same thickness as deck. Fusion weld 6 inches on center maximum.
- H. At openings between deck and walls, columns, and openings, provide sheet steel closures and angle flashings to close openings.
- I. Place metal cant strips in position and fusion weld.

EXHIBIT "A"

- J. Position roof drain pans with flange bearing on top surface of deck. Fusion weld at each deck flute.
- K. Immediately after welding deck and other metal components in position, coat welds, burned areas, and damaged surface coating, with touch-up primer.

END OF SECTION

SECTION 05 50 00

METAL FABRICATIONS

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Shop fabricated steel and aluminum items.
- B. Prefabricated ladders.

1.02 REFERENCE STANDARDS

- A. AAMA 611 - Voluntary Specification for Anodized Architectural Aluminum; American Architectural Manufacturers Association; 2012.
- B. ANSI A14.3 - American National Standard for Ladders -- Fixed -- Safety Requirements; 2008.
- C. ASTM A36/A36M - Standard Specification for Carbon Structural Steel; 2008.
- D. ASTM A123/A123M - Standard Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products; 2012.
- E. ASTM A153/A153M - Standard Specification for Zinc Coating (Hot-Dip) on Iron and Steel Hardware; 2009.
- F. ASTM A283/A283M - Standard Specification for Low and Intermediate Tensile Strength Carbon Steel Plates; 2012.
- G. ASTM A325 - Standard Specification for Structural Bolts, Steel, Heat-Treated, 120/105 ksi Minimum Tensile Strength; 2010.
- H. ASTM A500/A500M - Standard Specification for Cold-Formed Welded and Seamless Carbon Steel Structural Tubing in Rounds and Shapes; 2010a.
- I. ASTM B85/85M - Standard Specification for Aluminum-Alloy Die Castings; 2010.
- J. ASTM B209 - Standard Specification for Aluminum and Aluminum-Alloy Sheet and Plate; 2010.
- K. ASTM B210 - Standard Specification for Aluminum and Aluminum-Alloy Drawn Seamless Tubes; 2012.
- L. ASTM B211 - Standard Specification for Aluminum and Aluminum-Alloy Rolled or Cold Finished Bar, Rod, and Wire; 2012e1.
- M. ASTM B221 - Standard Specification for Aluminum and Aluminum-Alloy Extruded Bars, Rods, Wire, Profiles, and Tubes; 2012.
- N. AWS A2.4 - Standard Symbols for Welding, Brazing, and Nondestructive Examination; American Welding Society; 2012.
- O. AWS D1.1/D1.1M - Structural Welding Code - Steel; American Welding Society; 2010.
- P. AWS D1.2/D1.2M - Structural Welding Code - Aluminum; American Welding Society; 2008.
- Q. SSPC-Paint 15 - Steel Joist Shop Primer; Society for Protective Coatings; 1999 (Ed. 2004).
- R. SSPC-Paint 20 - Zinc-Rich Primers (Type I, "Inorganic," and Type II, "Organic"); Society for Protective Coatings; 2002 (Ed. 2004).
- S. SSPC-SP 2 - Hand Tool Cleaning; Society for Protective Coatings; 1982 (Ed. 2004).

1.03 SUBMITTALS

- A. Shop Drawings: Indicate profiles, sizes, connection attachments, reinforcing, anchorage, size and type of fasteners, and accessories. Include erection drawings, elevations, and details where applicable.
 - 1. Indicate welded connections using standard AWS A2.4 welding symbols. Indicate net weld lengths.
- B. Welders' Certificates: Submit certification for welders employed on the project, verifying AWS qualification within the previous 12 months.

PART 2 PRODUCTS

2.01 MATERIALS - STEEL

- A. Steel Angles, Channels, and Plates: ASTM A36/A36M.
- B. Steel Tubing: ASTM A500, Grade B cold-formed structural tubing.
- C. Plates: ASTM A283.
- D. Slotted Channel Framing: ASTM A653, Grade 33.
- E. Slotted Channel Fittings: ASTM A1011/A1011M.
- F. Fasteners: Slotted Channel System based on Unistrut P5500 system with related connectors and fasteners. www.unistrut.com.
- G. Bolts, Nuts, and Washers: ASTM A325 (ASTM A325M), Type 1, galvanized to ASTM A153/A153M where connecting galvanized components.
- H. Welding Materials: AWS D1.1/D1.1M; type required for materials being welded.
- I. Shop and Touch-Up Primer: SSPC-Paint 15, complying with VOC limitations of authorities having jurisdiction.
- J. Touch-Up Primer for Galvanized Surfaces: SSPC-Paint 20, Type I - Inorganic, complying with VOC limitations of authorities having jurisdiction.

2.02 MATERIALS - ALUMINUM

- A. Extruded Aluminum: ASTM B221 (ASTM B221M), 6063 alloy, T6 temper.
- B. Sheet Aluminum: ASTM B209 (ASTM B209M), 5052 alloy, H32 or H22 temper.
- C. Aluminum-Alloy Drawn Seamless Tubes: ASTM B210 (ASTM B210M), 6063 alloy, T6 temper.
- D. Aluminum-Alloy Bars: ASTM B211 (ASTM B211M), 6061 alloy, T6 temper.
- E. Aluminum-Alloy Die Castings: ASTM B85.
- F. Bolts, Nuts, and Washers: Stainless steel.
- G. Welding Materials: AWS D1.2/D1.2M; type required for materials being welded.

2.03 FABRICATION

- A. Fit and shop assemble items in largest practical sections, for delivery to site.
- B. Fabricate items with joints tightly fitted and secured.
- C. Grind exposed joints flush and smooth with adjacent finish surface. Make exposed joints butt tight, flush, and hairline. Ease exposed edges to small uniform radius.
- D. Exposed Mechanical Fastenings: Flush countersunk screws or bolts; unobtrusively located; consistent with design of component, except where specifically noted otherwise.

EXHIBIT "A"

PART 3 EXECUTION

3.01 EXAMINATION

- A. Verify that field conditions are acceptable and are ready to receive work.

3.02 PREPARATION

- A. Clean and strip primed steel items to bare metal where site welding is required.
- B. Supply setting templates to the appropriate entities for steel items required to be cast into concrete or embedded in masonry.

3.03 INSTALLATION

- A. Install items plumb and level, accurately fitted, free from distortion or defects.
- B. Provide for erection loads, and for sufficient temporary bracing to maintain true alignment until completion of erection and installation of permanent attachments.
- C. Perform field welding in accordance with AWS D1.1/D1.1M.
- D. Obtain approval prior to site cutting or making adjustments not scheduled.
- E. After erection, prime welds, abrasions, and surfaces not shop primed or galvanized, except surfaces to be in contact with concrete.

3.04 TOLERANCES

- A. Maximum Variation From Plumb: 1/4 inch per story, non-cumulative.
- B. Maximum Offset From True Alignment: 1/4 inch.
- C. Maximum Out-of-Position: 1/4 inch.

END OF SECTION

- E. Supply components required for anchorage of fabrications. Fabricate anchors and related components of same material and finish as fabrication, except where specifically noted otherwise.

2.04 FABRICATED ITEMS

- A. Ladder: Manufactured to meet OSHA certification. Design Basis is Aluminum Fixed Ladder w/Cage & Walk-Thru manufactured by Precision Ladder, Inc. Design to be in compliance with ANSI A14.3; with mounting brackets and attachments; mill finish. Cage protection, top landing, rails and access closure cage door at bottom of cage.
 - 1. Side Rails: 2 1/2 inches channel members spaced at 26 inches.
 - 2. Rungs: 2 1/2 inch diameter serrated aluminum tread spaced 12 inches on center.
 - 3. Space rungs 7 inches from wall surface.
- B. Ledge Angles, Shelf Angles, Channels, and Plates Not Attached to Structural Framing: For support of metal decking; prime paint finish.
- C. Lintels: As detailed; galvanized finish.
- D. Slotted Channel Framing: Fabricate channels and fittings from structural steel complying with the referenced standards; factory-applied, rust-inhibiting thermoset acrylic enamel finish.

2.05 FINISHES - STEEL

- A. Prime paint all steel items.
 - 1. Exceptions: Do not prime surfaces in direct contact with concrete, where field welding is required, and items to be covered with sprayed fireproofing.
- B. Prepare surfaces to be primed in accordance with SSPC-SP2.
- C. Clean surfaces of rust, scale, grease, and foreign matter prior to finishing.
- D. Prime Painting: One coat.
- E. Galvanizing of Structural Steel Members: Galvanize after fabrication to ASTM A123/A123M requirements.
- F. Galvanizing of Non-structural Items: Galvanize after fabrication to ASTM A123/A123M requirements.

2.06 FINISHES - ALUMINUM

- A. Exterior Aluminum Surfaces: Class I natural anodized.
- B. Interior Aluminum Surfaces: Class I natural anodized.
- C. Class I Natural Anodized Finish: AAMA 611 AA-M12C22A41 Clear anodic coating not less than 0.7 mils thick.
- D. Apply one coat of bituminous paint to concealed aluminum surfaces in contact with cementitious or dissimilar materials.

2.07 FABRICATION TOLERANCES

- A. Squareness: 1/8 inch maximum difference in diagonal measurements.
- B. Maximum Offset Between Faces: 1/16 inch.
- C. Maximum Misalignment of Adjacent Members: 1/16 inch.
- D. Maximum Bow: 1/8 inch in 48 inches.
- E. Maximum Deviation From Plane: 1/16 inch in 48 inches.

SECTION 05 52 13

PIPE AND TUBE RAILINGS

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Wall mounted handrails.
- B. Free-standing railings at ramps and platforms.

1.02 REFERENCE STANDARDS

- A. ASTM A53/A53M - Standard Specification for Pipe, Steel, Black and Hot-Dipped, Zinc-Coated, Welded and Seamless; 2012.
- B. ASTM A123/A123M - Standard Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products; 2012.
- C. ASTM A500/A500M - Standard Specification for Cold-Formed Welded and Seamless Carbon Steel Structural Tubing in Rounds and Shapes; 2010a.
- D. ASTM E935 - Standard Test Methods for Performance of Permanent Metal Railing Systems and Rails for Buildings; 2000 (Reapproved 2006).
- E. ASTM E985 - Standard Specification for Permanent Metal Railing Systems and Rails for Buildings; 2000 (Reapproved 2006).
- F. SSPC-Paint 15 - Steel Joist Shop Paint; The Society for Protective Coatings; 1999 (Ed. 2004).
- G. SSPC-Paint 20 - Zinc-Rich Primers (Type I, "Inorganic," and Type II, "Organic"); The Society for Protective Coatings; 2002 (Ed. 2004).

1.03 SUBMITTALS

- A. See Section 01 30 00 - Administrative Requirements, for submittal procedures.
- B. Shop Drawings: Indicate profiles, sizes, connection attachments, anchorage, size and type of fasteners, and accessories.
- C. Samples: Submit two, 12 inch long samples of handrail. Submit two samples of elbow, wall bracket, and end stop.

PART 2 PRODUCTS

2.01 MANUFACTURERS

- A. Handrails and Railings:
 1. C. R. Laurence Co., Inc.; www.crlaurence.com.
 2. American Railing Systems, Inc.; www.americanrailing.com.
 3. Elite Custom Railing, Inc.; www.eliterailing.com.
 4. The Wagner Companies; www.wagnercompanies.com.
 5. Substitutions: See Section 01 60 00 - Product Requirements.

2.02 RAILINGS - GENERAL REQUIREMENTS

- A. Design, fabricate, and test railing assemblies in accordance with the most stringent requirements of ASTM E985 and applicable local code.
- B. Design railing assembly, wall rails, and attachments to resist lateral force of 75 lbs at any point without damage or permanent set. Test in accordance with ASTM E 935.
- C. Allow for expansion and contraction of members and building movement without damage to

EXHIBIT "A"

connections or members.

- D. Dimensions: See drawings for configurations and heights.
 - 1. Top Rails, Lower Hand Rails and Wall Hand Rails: Maximum 1-1/2 inches outside diameter, round.
 - 2. Intermediate Rails: Maximum 1-1/2 inches outside diameter, round.
 - 3. Posts: 1-1/2 inches outside diameter, round.
- E. Provide anchors and other components as required to attach to structure, made of same materials as railing components unless otherwise indicated; where exposed fasteners are unavoidable provide flush countersunk fasteners.
 - 1. For anchorage to concrete, provide inserts to be cast into concrete, for bolting anchors.
 - 2. For anchorage to masonry, provide brackets to be embedded in masonry, for bolting anchors.
 - 3. Posts: Provide adjustable flanged brackets.
- F. Provide mechanical and welding fittings where indicated to join lengths, seal open ends, and conceal exposed mounting bolts and nuts, including but not limited to elbows, T-shapes, splice connectors, flanges, escutcheons, and wall brackets.

2.03 STEEL RAILING SYSTEM - Exterior Railing Systems

- A. Steel Tube: ASTM A 500, Grade B cold-formed structural tubing.
- B. Steel Pipe: ASTM A 53/A 53M, Grade B Schedule 40, black finish.
- C. Non-Weld Mechanical Fittings: Slip-on, galvanized malleable iron castings, for Schedule 40 pipe, with flush setscrews for tightening by standard hex wrench, no bolts or screw fasteners.
- D. Welding Fittings: Factory- or shop-welded from matching pipe or tube; seams continuously welded; joints and seams ground smooth.
- E. Exposed Fasteners: No exposed bolts or screws.
- F. Straight Splice Connectors: Steel concealed spigots.
- G. Galvanizing: In accordance with requirements of ASTM A123/A123M.
 - 1. Touch-Up Primer for Galvanized Surfaces: SSPC-Paint 20, Type I - Inorganic.
- H. Shop and Touch-Up Primer: SSPC-Paint 15, complying with VOC limitations of authorities having jurisdiction.

2.04 FABRICATION

- A. Accurately form components to suit specific project conditions and for proper connection to building structure.
- B. Fit and shop assemble components in largest practical sizes for delivery to site.
- C. Fabricate components with joints tightly fitted and secured. Provide spigots and sleeves to accommodate site assembly and installation.
- D. Welded Joints:
 - 1. Exterior Components: Continuously seal joined pieces by intermittent welds and plastic filler. Drill condensate drainage holes at bottom of members at locations that will not encourage water intrusion.
 - 2. Interior Components: Continuously seal joined pieces by intermittent welds and plastic filler.
 - 3. Grind exposed joints flush and smooth with adjacent finish surface. Make exposed joints butt tight, flush, and hairline. Ease exposed edges to small uniform radius.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Verify that field conditions are acceptable and are ready to receive work.

3.02 PREPARATION

- A. Clean and strip primed steel items to bare metal where site welding is required.
- B. Supply items required to be cast into concrete or embedded in masonry with setting templates, for installation as work of other sections.

3.03 INSTALLATION

- A. Install in accordance with manufacturer's instructions.
- B. Install components plumb and level, accurately fitted, free from distortion or defects, with tight joints.
- C. Anchor railings securely to structure.
- D. Field weld anchors as indicated on drawings. Touch-up welds with primer. Grind welds smooth.
- E. Conceal anchor bolts and screws whenever possible. Where not concealed, use flush countersunk fastenings.

3.04 TOLERANCES

- A. Maximum Variation From Plumb: 1/4 inch per floor level, non-cumulative.
- B. Maximum Offset From True Alignment: 1/4 inch.
- C. Maximum Out-of-Position: 1/4 inch.

END OF SECTION

EXHIBIT "A"

SECTION 06 10 00

ROUGH CARPENTRY

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Non-structural dimension lumber framing.
- B. Rough opening framing for doors, windows, and roof openings.
- C. Preservative treated wood materials.
- D. Miscellaneous framing and sheathing.
- E. Communications and electrical room mounting boards.
- F. Wood nailers and curbs for roofing and items installed on roof.
- G. Roofing cant strips.
- H. Concealed wood blocking, nailers, and supports.
- I. Miscellaneous wood nailers, furring, and grounds.

1.02 REFERENCE STANDARDS

- A. AFPA (WFCM) - Wood Frame Construction Manual for One- and Two-Family Dwellings; American Forest and Paper Association; 2012.
- B. ASTM A153/A153M - Standard Specification for Zinc Coating (Hot-Dip) on Iron and Steel Hardware; 2009.
- C. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials; 2012.
- D. AWPA C2 - Lumber, Timber, Bridge Ties and Mine Ties -- Preservative Treatment by Pressure Processes; American Wood-Preservers' Association; 2002.
- E. AWPA U1 - Use Category System: User Specification for Treated Wood; American Wood Protection Association; 2010.
- F. PS 20 - American Softwood Lumber Standard; National Institute of Standards and Technology (Department of Commerce); 2005.
- G. SPIB (GR) - Grading Rules; Southern Pine Inspection Bureau, Inc.; 2002.

1.03 QUALITY ASSURANCE

- A. Lumber: Comply with PS 20 and approved grading rules and inspection agencies.
 - 1. Acceptable Lumber Inspection Agencies: Any agency with rules approved by American Lumber Standards Committee.
- B. Preservative-Treated Wood: Provide lumber and plywood marked or stamped by an ALSC-accredited testing agency, certifying level and type of treatment in accordance with AWPA standards.

1.04 DELIVERY, STORAGE, AND HANDLING

- A. General: Cover wood products to protect against moisture. Support stacked products to prevent deformation and to allow air circulation.

PART 2 PRODUCTS

2.01 GENERAL REQUIREMENTS

- A. Dimension Lumber: Comply with PS 20 and requirements of specified grading agencies.
 - 1. If no species is specified, provide any species graded by the agency specified; if no grading agency is specified, provide lumber graded by any grading agency meeting the specified requirements.
 - 2. Grading Agency: Any grading agency whose rules are approved by the Board of Review, American Lumber Standard Committee (www.alsc.org) and who provides grading service for the species and grade specified; provide lumber stamped with grade mark unless otherwise indicated.
- B. Lumber fabricated from old growth timber is not permitted.
- C. Provide wood harvested within a 500 mile radius of the project site; see Section 01 60 00 for requirements for locally-sourced products.

2.02 DIMENSION LUMBER FOR CONCEALED APPLICATIONS

- A. Grading Agency: Southern Pine Inspection Bureau, Inc. (SPIB).
- B. Sizes: Nominal sizes as indicated on drawings, S4S.
- C. Moisture Content: S-dry or MC19.
- D. Stud Framing (2 by 2 through 2 by 6):
 - 1. Species: Any allowed under referenced grading rules.
 - 2. Grade: No. 2.
- E. Miscellaneous Framing, Blocking, Nailers, Grounds, and Furring:
 - 1. Lumber: S4S, No. 2 or Standard Grade.
 - 2. Boards: Standard or No. 3.
- F. Miscellaneous Blocking, Furring, and Nailers:
 - 1. Lumber: S4S, No. 2 or Standard Grade.
 - 2. Boards: Standard or No. 3.

2.03 EXPOSED BOARDS

- A. Submit manufacturer's certificate that products meet or exceed specified requirements, in lieu of grade stamping.
- B. Moisture Content: Kiln-dry (15 percent maximum).
- C. Surfacing: S4S.
- D. Species: Southern Pine.
- E. Grade: No. 2, 2 Common, or Construction.

2.04 CONSTRUCTION PANELS

- A. Subfloor/Underlayment Combination: APA PRP-108, Rated Sturd-I-Floor.
 - 1. Exposure Class: Exterior.
 - 2. Span Rating: 16 inches.
 - 3. Thickness: 1-1/8 inches, nominal.
- B. Communications and Electrical Room Mounting Boards: Interior grade, A-D plywood, or medium density fiberboard; 3/4 inch thick; flame spread index of 25 or less, smoke developed index of 450 or less, when tested in accordance with ASTM E 84. These panels to be painted with fire-resistive coating.

2.05 ACCESSORIES

- A. Fasteners and Anchors:
 - 1. Metal and Finish: Hot-dipped galvanized steel per ASTM A 153/A 153M for high humidity and preservative-treated wood locations, unfinished steel elsewhere.
 - 2. Drywall Screws: Bugle head, hardened steel, power driven type, length three times thickness of sheathing.
 - 3. Anchors: Toggle bolt type for anchorage to hollow masonry.

2.06 FACTORY WOOD TREATMENT

- A. Treated Lumber and Plywood: Comply with requirements of AWPA U1 - Use Category System for wood treatments determined by use categories, expected service conditions, and specific applications.
 - 1. Preservative-Treated Wood: Provide lumber and plywood marked or stamped by an ALSC-accredited testing agency, certifying level and type of treatment in accordance with AWPA standards.
- B. Preservative Treatment:
- C. Preservative Pressure Treatment of Lumber Above Grade: AWPA U1, Use Category UC3B, Commodity Specification A using waterborne preservative to 0.25 lb/cu ft retention.
 - 1. Kiln dry lumber after treatment to maximum moisture content of 19 percent.
 - 2. Treat lumber in contact with roofing, flashing, or waterproofing.
 - 3. Treat lumber in contact with masonry or concrete.
 - 4. Treat lumber less than 18 inches above grade.

PART 3 EXECUTION

3.01 PREPARATION

- A. Coordinate installation of rough carpentry members specified in other sections.

3.02 INSTALLATION - GENERAL

- A. Select material sizes to minimize waste.
- B. Where treated wood is used on interior, provide temporary ventilation during and immediately after installation sufficient to remove indoor air contaminants.

3.03 FRAMING INSTALLATION

- A. Set structural members level, plumb, and true to line. Discard pieces with defects that would lower required strength or result in unacceptable appearance of exposed members.
- B. Make provisions for temporary construction loads, and provide temporary bracing sufficient to maintain structure in true alignment and safe condition until completion of erection and installation of permanent bracing.
- C. Comply with member sizes, spacing, and configurations indicated, and fastener size and spacing indicated, but not less than required by applicable codes and AFPA Wood Frame Construction Manual.
- D. Frame wall openings with two or more studs at each jamb; support headers on cripple studs.

3.04 BLOCKING, NAILERS, AND SUPPORTS

- A. Provide framing and blocking members as indicated or as required to support finishes, fixtures, specialty items, and trim.
- B. In metal stud walls, provide continuous blocking around door and window openings for anchorage of frames, securely attached to stud framing.
- C. In walls, provide blocking attached to studs as backing and support for wall-mounted items,

unless item can be securely fastened to two or more studs or other method of support is explicitly indicated.

- D. Where ceiling-mounting is indicated, provide blocking and supplementary supports above ceiling, unless other method of support is explicitly indicated.

3.05 ROOF-RELATED CARPENTRY

- A. Coordinate installation of roofing carpentry with deck construction, framing of roof openings, and roofing assembly installation.
- B. Provide wood curb at all roof openings except where specifically indicated otherwise. Form corners by alternating lapping side members.
- C. Provide miscellaneous members as indicated or as required to support finishes, fixtures, specialty items, and trim.
- D. Where treated wood is used on interior, provide temporary ventilation during and immediately after installation sufficient to remove indoor air contaminants.

3.06 INSTALLATION OF ACCESSORIES AND MISCELLANEOUS WOOD

- A. Curb roof openings except where prefabricated curbs are provided. Form corners by alternating lapping side members.
- B. Coordinate curb installation with installation of decking and support of deck openings.

3.07 INSTALLATION OF CONSTRUCTION PANELS

- A. Communications and Electrical Room Mounting Boards: Secure with screws to studs with edges over firm bearing; space fasteners at maximum 24 inches on center on all edges and into studs in field of board.
 1. At fire-rated walls, install board over wall board indicated as part of the fire-rated assembly.
 2. Where boards are indicated as full floor-to-ceiling height, install with long edge of board parallel to studs.
 3. Install adjacent boards without gaps.

3.08 SITE APPLIED WOOD TREATMENT

- A. Apply preservative treatment compatible with factory applied treatment at site-sawn cuts, complying with manufacturer's instructions.
- B. Allow preservative to dry prior to erecting members.

3.09 TOLERANCES

- A. Framing Members: 1/4 inch from true position, maximum.
- B. Surface Flatness of Floor: 1/8 inch in 10 feet maximum, and 1/4 inch in 30 feet maximum.
- C. Variation from Plane (Other than Floors): 1/4 inch in 10 feet maximum, and 1/4 inch in 30 feet maximum.

3.10 CLEANING

- A. Waste Disposal: Comply with the requirements of Section 01 74 19.
 1. Comply with applicable regulations.
 2. Do not burn scrap on project site.
 3. Do not burn scraps that have been pressure treated.
 4. Do not send materials treated with pentachlorophenol, CCA, or ACA to co-generation facilities or "waste-to-energy" facilities.
- B. Do not leave any wood, shavings, sawdust, etc. on the ground or buried in fill.

EXHIBIT "A"

- C. Prevent sawdust and wood shavings from entering the storm drainage system.

END OF SECTION

SECTION 06 41 00

ARCHITECTURAL WOOD CASEWORK

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Specially fabricated cabinet units.
- B. Countertops.
- C. Cabinet hardware.
- D. Preparation for installing utilities.

1.02 REFERENCE STANDARDS

- A. AWI/AWMAC/MI (AWS) - Architectural Woodwork Standards; 2009.
- B. BHMA A156.9 - American National Standard for Cabinet Hardware; Builders Hardware Manufacturers Association; 2010 (ANSI/BHMA A156.9).
- C. GSA CID A-A-1936 - Adhesive, Contact, Neoprene Rubber; Federal Specifications and Standards; Revision A, 1996.
- D. NEMA LD 3 - High-Pressure Decorative Laminates; National Electrical Manufacturers Association; 2005.

1.03 SUBMITTALS

- A. See Section 01 30 00 - Administrative Requirements, for submittal procedures.
- B. Product Data: Provide data for hardware accessories.
- C. Samples: Submit actual samples of architectural cabinet construction, minimum 12 inches square, illustrating proposed cabinet substrate and finish.
- D. Samples: Submit actual sample items of proposed pulls and hinges, demonstrating hardware design, quality, and finish.

1.04 QUALITY ASSURANCE

1.05 DELIVERY, STORAGE, AND HANDLING

- A. Protect units from moisture damage.

1.06 FIELD CONDITIONS

- A. During and after installation of custom cabinets, maintain temperature and humidity conditions in building spaces at same levels planned for occupancy.

PART 2 PRODUCTS

2.01 MANUFACTURERS

- A. SCO-DON Millworks, Inc. Telephone: (904) 730-5004
- B. Commercial Casework, Inc. Telephone: (904) 264-4222.
- C. Architectural Innovators, Inc. Telephone (912) 882-7850
- D. Custom fabrication by qualified millwork shop is acceptable, if products meet the requirements of this specification. Custom millwork shop must receive prior approval by architect, prior to bid.

EXHIBIT "A"

E. Substitutions: See Section 01 60 00 - Product Requirements.

2.02 CABINETS

- A. Quality Grade: Unless otherwise indicated provide products of quality specified by AWI//AWMAC/M Architectural Woodwork Standards for Custom Grade.
- B. Plastic Laminate Faced Cabinets: Custom grade.

2.03 LAMINATE MATERIALS

- A. Manufacturers:
 - 1. Formica Corporation: www.formica.com.
 - 2. Panolam Industries International, Inc/Nevamar: www.nevamar.com.
 - 3. Wilsonart International, Inc: www.wilsonart.com.
 - 4. Substitutions: See Section 01 60 00 - Product Requirements.
- B. High Pressure Decorative Laminate (HPDL): NEMA LD 3, types as recommended for specific applications and as follows:
 - 1. Horizontal Surfaces: (Cabinet tops) HGS, 0.048 inch nominal thickness, colors as scheduled, satin finish.
 - 2. Vertical Surfaces: VGS, 0.028 inch nominal thickness, colors as scheduled, satin finish.
 - 3. Post-Formed Horizontal Surfaces: HGP, 0.039 inch nominal thickness, colors as scheduled, satin finish.
 - 4. Post-Formed Vertical Surfaces: VGP, 0.028 inch nominal thickness, through color, colors as scheduled, satin finish.
 - 5. Cabinet Liner: (Open Shelves and Cabinets) CLS, 0.020 inch nominal thickness, colors as scheduled, satin finish.
 - 6. Laminate Backer: BKL, 0.020 inch nominal thickness, undecorated; for application to concealed backside of panels faced with high pressure decorative laminate.

2.04 COUNTERTOPS

- A. Cultured Marble Surfacing: Specified in Section 12 36 00.
- B. Plastic Laminate Countertops: Plywood substrate covered with HPDL, conventionally fabricated, with decorative plastic edge.

2.05 ACCESSORIES

- A. Adhesive: GSA CID A-A-1936 contact adhesive.
- B. Plastic Edge Banding: Extruded PVC, flat shaped; smooth finish; of width to match component thickness.
- C. Fasteners: Size and type to suit application.
- D. Bolts, Nuts, Washers, Lags, Pins, and Screws: Of size and type to suit application; galvanized or chrome-plated finish in concealed locations and stainless steel, or chrome-plated finish in exposed locations.
- E. Concealed Joint Fasteners: Threaded steel.
- F. Grommets: plastic material for cut-outs (2 1/2" diameter opening).

2.06 HARDWARE

- A. Hardware: BHMA A156.9, types as indicated for quality grade specified.
- B. Shelf Standards and Rests: recessed metal shelf standards or multiple holes for pin supports. Shelf rests to be plastic or metal.

EXHIBIT "A"

- C. Drawer and Door Pulls: "U" shaped wire pull, aluminum with satin finish, 4 inch centers or brass with chrome matt finish.
- D. Cabinet Locks: Keyed cylinder, two keys per lock, master keyed, steel with chrome finish. Provide locks on all cabinet doors and drawers, keyed alike in each room, but separately from other rooms.
- E. Catches: Magnetic. Provide elbow catches on double doors.
- F. Drawer Slides: (Blum Standard 230M).
 - 1. Static Load Capacity: Commercial grade.
 - 2. Mounting: Bottom mounted.
 - 3. Stops: Integral type.
- G. Hinges: 2 3/4" Full surface (decorative) type, five knuckle wraparound reveal overlay steel with satin finish (Rockford 32MM).

2.07 FABRICATION

- A. Assembly: Shop assemble cabinets for delivery to site in units easily handled and to permit passage through building openings.
- B. Edging: Fit shelves, doors, and exposed edges with specified edging. Do not use more than one piece for any single length.
- C. Cap exposed plastic laminate finish edges with plastic trim. Provide 3MM PVC edge where exposed and .05MM PVC on unexposed edge.
- D. Door and Drawer Fronts: 3/4 inch thick; reveal overlay style.
- E. Fitting: When necessary to cut and fit on site, provide materials with ample allowance for cutting. Provide matching trim for scribing and site cutting.
- F. Plastic Laminate: Apply plastic laminate finish in full uninterrupted sheets consistent with manufactured sizes. Fit corners and joints hairline; secure with concealed fasteners. Slightly bevel arises. Locate counter butt joints minimum 2 feet from sink cut-outs.
- G. Apply wood laminate by grain matching adjacent sheets to book matching.
- H. Apply laminate backing sheet to reverse side of plastic laminate finished surfaces.
- I. Provide cutouts for plumbing fixtures. Verify locations of cutouts from on-site dimensions. Prime paint cut edges.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Verify adequacy of backing and support framing.
- B. Verify location and sizes of utility rough-in associated with work of this section.

3.02 INSTALLATION

- A. Set and secure custom cabinets in place, assuring that they are rigid, plumb, and level.
- B. Use fixture attachments in concealed locations for wall mounted components.
- C. Use concealed joint fasteners to align and secure adjoining cabinet units.
- D. Carefully scribe casework abutting other components, with maximum gaps of 1/32 inch. Do not use additional overlay trim for this purpose.
- E. Secure cabinets to floor using appropriate angles and anchorages.

EXHIBIT "A"

- F. Countersink anchorage devices at exposed locations. Conceal with solid wood plugs of species to match surrounding wood; finish flush with surrounding surfaces.

3.03 ADJUSTING

- A. Adjust installed work.
- B. Adjust moving or operating parts to function smoothly and correctly.

3.04 CLEANING

- A. Clean casework, counters, shelves, hardware, fittings, and fixtures.

END OF SECTION

SECTION 07 11 13

BITUMINOUS DAMPPROOFING

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Bituminous dampproofing.

1.02 REFERENCE STANDARDS

- A. ASTM D41 - Standard Specification for Asphalt Primer Used in Roofing, Dampproofing, and Waterproofing; 2011.
- B. ASTM D449 - Standard Specification for Asphalt Used in Dampproofing and Waterproofing; 2003 (Reapproved 2008).
- C. ASTM D1187/D1187M - Standard Specification for Asphalt-Base Emulsions for Use as Protective Coatings for Metal; 1997 (Reapproved 2011).
- D. ASTM D1227 - Standard Specification for Emulsified Asphalt Used as a Protective Coating for Roofing; 1995 (Reapproved 2007).
- E. ASTM D4586/D4586M - Standard Specification for Asphalt Roof Cement, Asbestos-Free; 2007 (Reapproved 2012)e1.
- F. NRCA ML104 - The NRCA Roofing and Waterproofing; National Roofing Contractors Association; Fifth Edition, with interim updates.

1.03 SUBMITTALS

- A. See Section 01 30 00 - Administrative Requirements, for submittal procedures.
- B. Product Data: Provide properties of primer, bitumen, and mastics.
- C. Manufacturer's Installation Instructions: Indicate special procedures and perimeter conditions requiring special attention.

1.04 QUALITY ASSURANCE

- A. Perform work in accordance with NRCA Roofing and Waterproofing Manual.

1.05 FIELD CONDITIONS

- A. Maintain ambient temperatures above 40 degrees F for 24 hours before and during application until dampproofing has cured.

PART 2 PRODUCTS

2.01 MANUFACTURERS

- A. Other Acceptable Manufacturers:
 - 1. Karnak Corporation: www.karnakcorp.com.
 - 2. Mar-Flex Systems, Inc: www.mar-flex.com.
 - 3. W.R. Meadows, Inc: www.wrmeadows.com.
 - 4. Substitutions: See Section 01 60 00 - Product Requirements.

2.02 DAMPPROOFING PRODUCTS

- A. Bituminous Dampproofing: Cold-applied water-based emulsion; asphalt with mineral colloid or chemical emulsifying agent; with or without fiber reinforcement; asbestos-free; suitable for application on vertical and horizontal surfaces.
 - 1. Composition - Vertical Application: ASTM D1227 Type II.

EXHIBIT "A"

2. VOC Content: Not more than permitted by local, State, and federal regulations.
3. Applied Thickness: Two coats to achieve 1/8 inch, minimum, wet film.
4. Products: Design Basis -
 - a. W.R. Meadows, Inc.; Sealmatic Emulsion Type II (brush/spray-grade):
www.wrmeadows.com.

B. Primers, Mastics, and Related Materials: Type as recommended by dampproofing manufacturer.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Verify existing conditions before starting work.
- B. Verify substrate surfaces are durable, free of matter detrimental to adhesion or application of dampproofing system.
- C. Verify that items that penetrate surfaces to receive dampproofing are securely installed.

3.02 PREPARATION

- A. Protect adjacent surfaces not designated to receive dampproofing.
- B. Clean and prepare surfaces to receive dampproofing in accordance with manufacturer's instructions.
- C. Do not apply dampproofing to surfaces unacceptable to manufacturer.
- D. Apply mastic to seal penetrations, small cracks, or minor honeycomb in substrate.

3.03 APPLICATION

- A. CMU inside of masonry walls and at concrete steps, landings and foundation walls with earth fill: Apply two coats of dampproofing.
- B. Prime surfaces in accordance with manufacturer's instructions.
- C. Apply bitumen with roller.
- D. Apply dampproofing to exterior face of CMU structural masonry and concrete walls behind rigid insulation and brick veneer, full height from top of roof tie beam to top of footing below.
- E. Apply bitumen in two coats, continuous and uniform, at a rate of 1 gal/100 sq ft per coat.
- F. Seal items projecting through dampproofing surface with mastic. Seal watertight.

END OF SECTION

SECTION 07 21 00

THERMAL INSULATION

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Board insulation at cavity wall construction, perimeter foundation wall, and exterior wall behind masonry veneer wall finish.
- B. Batt insulation in exterior wall and ceiling construction.
- C. Batt insulation for filling perimeter window and door shim spaces and crevices in exterior wall and roof.

1.02 REFERENCE STANDARDS

- A. ASTM C665 - Standard Specification for Mineral-Fiber Blanket Thermal Insulation for Light Frame Construction and Manufactured Housing; 2012.
- B. ASTM C1289 - Standard Specification for Faced Rigid Cellular Polyisocyanurate Thermal Insulation Board; 2012.
- C. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials; 2012.

1.03 SUBMITTALS

- A. See Section 01 30 00 - Administrative Requirements, for submittal procedures.
- B. Product Data: Provide data on product characteristics, performance criteria, and product limitations.
- C. Manufacturer's Installation Instructions: Include information on special environmental conditions required for installation and installation techniques.
- D. Manufacturer's Certificate: Certify that products meet or exceed specified requirements.

1.04 FIELD CONDITIONS

- A. Do not install insulation adhesives when temperature or weather conditions are detrimental to successful installation.

1.05 SEQUENCING

- A. Sequence work to ensure Bituminous Dampproofing materials are in place before beginning work of this section.

PART 2 PRODUCTS

2.01 MANUFACTURERS

- A. Insulation:
 - 1. Dow Chemical Co : Rigid Board insulation
 - 2. Substitutions: See Section 01 60 00 - Product Requirements.

2.02 APPLICATIONS

- A. Board Insulation Inside Masonry Cavity Walls: Two layers of 2 inch thick Cellular Polyurethane/Polyisocyanurate board. Minimum R-value of 13 each layer. (Two layers of 2 inch thick Polyisocyanurate to provide 4 inch thickness with R-value of 26)
- B. Batt Insulation in Metal Framed Walls: 3.5 inch thick Batt insulation with no vapor retarder.

EXHIBIT "A"

- C. Insulation Above Exterior Soffit Ceilings: Batt insulation with no vapor retarder.

2.03 FOAM BOARD INSULATION MATERIALS

- A. Board Insulation: Polyisocyanurate or Polyurethane CFC 11 Board Insulation: Rigid cellular foam, complying with ASTM C1289;
1. Flame Spread Index: 25 or less, when tested in accordance with ASTM E84.
 2. Flame Spread Index: 75 or less, when tested in accordance with ASTM E84.
 3. Smoke Developed Index: 450 or less, when tested in accordance with ASTM E84.
 4. Compressive Strength: 16 psi
 5. Facing: Manufacturer's standard.
 6. Board Thickness: 4 inch.
 7. Thermal Resistance: R-value of 26.
 8. Board Edges: Square.
 9. Manufacturers:
 - a. Dow Chemical Co: www.dow.com.

2.04 BATT INSULATION MATERIALS

- A. Glass Fiber Batt Insulation: Flexible preformed batt or blanket, complying with ASTM C665; friction fit.
- B. Batt Insulation: ASTM C 665; preformed batt; friction fit, conforming to the following:
1. Material: Glass fiber.
 2. Flame Spread Index: 25 or less, when tested in accordance with ASTM E84.
 3. Smoke Developed Index: 450 or less, when tested in accordance with ASTM E84.
 4. Surface Burning Characteristics: Flame spread index of 25 or less; smoke developed index of 450 or less, when tested in accordance with ASTM E 84.
 5. Formaldehyde Content: Zero.
 6. Thermal Resistance: R of 26 minimum at walls and R of 38 minimum at ceiling/attic areas where indicated.
 7. Thickness: 6 1/4 inch and 9 1/2 inch where indicated.
 8. Facing: Unfaced.
 9. Surface Burning Characteristics: Flame spread/Smoke developed index of 10/10, when tested in accordance with ASTM E 84.
 10. Manufacturers:
 - a. CertainTeed Corporation: www.certainteed.com.
 - b. Johns Manville Corporation: www.jm.com.
 - c. Owens Corning Corp: www.owenscorning.com.

2.05 ACCESSORIES

- A. Sheet Vapor Retarder: Black polyethylene film reinforced with glass fiber square mesh, 10 mil thick.
- B. Tape: Bright aluminum self-adhering type, mesh reinforced, 2 inch wide.
- C. Nails or Staples: Steel wire; electroplated, or galvanized; type and size to suit application.
- D. Wire Mesh: Galvanized steel, hexagonal wire mesh.
- E. Adhesive: Type recommended by insulation manufacturer for application.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Verify that substrate, adjacent materials, and insulation materials are dry and that substrates are ready to receive insulation.

EXHIBIT "A"

- B. Verify substrate surfaces are flat, free of honeycomb, fins, or irregularities.

3.02 BOARD INSTALLATION AT FOUNDATION PERIMETER

- A. Adhere a 6 inch wide strip of polyethylene sheet over construction, control, and expansion joints with double beads of adhesive each side of joint.
- B. Apply adhesive to back of boards:
 - 1. Three continuous beads per board length.
- C. Install boards vertically on foundation perimeter.
 - 1. Install in running bond pattern.
 - 2. Butt edges and ends tightly to adjacent boards and to protrusions.
- D. Extend boards over expansion joints, unbonded to foundation on one side of joint.
- E. Cut and fit insulation tightly to protrusions or interruptions to the insulation plane.

3.03 BOARD INSTALLATION AT CAVITY WALLS

- A. Adhere a 6 inch wide strip of polyethylene sheet over expansion joints with double beads of adhesive each side of joint.
 - 1. Tape seal joints between sheets.
 - 2. Extend sheet full height of joint.
- B. Apply waterproof adhesive to back of boards:
 - 1. Three continuous beads per board length.
 - 2. Apply waterproof adhesive to back of each layer of insulation to achieve total thickness required.
 - 3. Full bed 1/8 inch thick.
- C. Install boards to fit snugly between wall ties.
- D. Install boards horizontally on walls.
 - 1. Place boards to maximize adhesive contact.
 - 2. Install in running bond pattern.
 - 3. Butt edges and ends tightly to adjacent boards and to protrusions.
- E. Cut and fit insulation tightly to protrusions or interruptions to the insulation plane.
- F. Place 6 inch wide polyethylene sheet at perimeter of wall openings, from dampproofing or adhesive vapor retarder bed to window and door frames. Tape seal in place to ensure continuity of vapor retarder and air seal.

3.04 BATT INSTALLATION

- A. Install insulation in accordance with manufacturer's instructions.
- B. Install in exterior wall spaces without gaps or voids. Do not compress insulation.
- C. Trim insulation neatly to fit spaces. Insulate miscellaneous gaps and voids.
- D. Fit insulation tightly in cavities and tightly to exterior side of mechanical and electrical services within the plane of the insulation.

3.05 PROTECTION

- A. Do not permit installed insulation to be damaged prior to its concealment.

END OF SECTION

SECTION 07 52 00

MODIFIED BITUMINOUS MEMBRANE ROOFING

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Design Basis Manufacturer is Siplast systems. Acceptable Manufacturers of "equal" product systems are Soprema and JohnsManville
- B. Modified bituminous roofing membrane, conventional application. Modifications at existing re-roofing tear-off and new roof areas shall provide new roof construction at all areas.
- C. Insulation, flat and tapered.
- D. Vapor retarders.
- E. Deck sheathing.
- F. Sheet flashing - metal-Clad Modified Bitumen Flashing. Optional use of Liquid Flashing - Catalyzed Acrylic Resin Flashing is acceptable in non-parapet areas.
- G. Roofing cant strips, accessories, roofing expansion joints, and walkway pads.
- H. Modifications to existing modified and built-up roofing over light weight insulating concrete deck on metal deck for existing roof mounted HVAC units, equipment and flashings. Addition of new tapered rigid insulation as indicated.
- I. Removal and replacement of existing roof selected metal flashings, expansion joints, roof curbs.
- J. Removal and replacement of damaged existing pressure treated wood nailers and blocking.

1.02 REFERENCE STANDARDS

- A. ASTM C1177/C1177M - Standard Specification for Glass Mat Gypsum Substrate for Use as Sheathing; 2008.
- B. ASTM C1289 - Standard Specification for Faced Rigid Cellular Polyisocyanurate Thermal Insulation Board; 2012.
- C. ASTM D41 - Standard Specification for Asphalt Primer Used in Roofing, Dampproofing, and Waterproofing; 2011.
- D. ASTM D4586/D4586M - Standard Specification for Asphalt Roof Cement, Asbestos-Free; 2007 (Reapproved 2012)e1.
- E. ASTM D6163 - Standard Specification for Styrene Butadiene Styrene (SBS) Modified Bituminous Sheet Materials Using Glass Fiber Reinforcements; 2000 (Reapproved 2008).
- F. ASTM D6164 - Standard Specification for Styrene Butadiene Styrene (SBS) Modified Bituminous Sheet Materials Using Polyester Reinforcements; 2011.
- G. ASTM D6298 - Standard Specification for Fiberglass Reinforced Styrene Butadiene Styrene (SBS) Modified Bituminous Sheets with a Factory Applied Metal Surface; 2005.
- H. FM DS 1-28 - Wind Design; Factory Mutual Research Corporation; 2007.
- I. NRCA ML104 - The NRCA Roofing and Waterproofing Manual; National Roofing Contractors Association; Fifth Edition, with interim updates.

1.03 ADMINISTRATIVE REQUIREMENTS

- A. Coordinate with installation of associated flashings and counterflashings installed by other

sections.

- B. Preinstallation Meeting: Convene one week before starting work of this section.
 1. Review preparation and installation procedures and coordinating and scheduling required with related work.

1.04 SUBMITTALS

- A. See Section 01 30 00 - Administrative Requirements, for submittal procedures.
- B. Product Data: Provide manufacturer's catalog data for membrane and bitumen materials, base flashing materials, insulation, and surfacing.
- C. Shop Drawings: Indicate joint or termination detail conditions, conditions of interface with other materials, mechanical fastener layout, and crickets.
- D. Samples: Submit two samples 6x6 inches in size illustrating granule surfaced sheet, colored coated sheet, insulation, and aluminum faced flashing.
- E. Installer's qualification data.
- F. Manufacturer's Installation Instructions: Indicate special procedures.
- G. Manufacturer's Certificate: Certify that products meet or exceed specified requirements.
- H. Manufacturer's Field Reports: Indicate procedures followed.
- I. Warranty: Submit manufacturer warranty and ensure forms have been completed in City of Fernandina Beach, Florida's name and registered with manufacturer.
 1. Roof Membrane/Total System Guarantee: Upon completion of the project, and after all post installation procedures have been completed, furnish the Owner with the manufacturer's twenty-year labor and materials guarantee covering the rigid insulation, cover board, insulation and membrane fasteners/plates, and roof membrane/flashing system. The guarantee shall be a term type, without deductibles or limitations on coverage amount, and shall be issued at no additional cost to the Owner.

1.05 QUALITY ASSURANCE

- A. Perform work in accordance with NRCA Roofing and Waterproofing Manual and manufacturer's instructions.
- B. FBC 2010, product rule 9B-72 (Updated September 4, 2003) applies to products to be installed in the building envelope.
 1. Provide applicable Florida Building product approval numbers (NOA) with shop drawing submittals. Applicable products without product approval numbers will not be acceptable in this project.
 2. Products and manufacturers include exterior walls, windows, panel walls, roofing products, shutters, skylights, structural components and other products comprising the Building's Envelope.
 3. Low Slope Roofing will be installed on building; Roofing System must be certified to meet approximately 130 MPH (Vult.) Wind requirements, as indicated on Structural Wind Diagram.
- C. Manufacturer will furnish a wind design analysis prepared and sealed by a State of Florida licensed Professional Engineer. The wind design analysis will include wind design analysis per ASCE 7-05 utilizing 130 MPH wind speed, negative pressure values for each zone, and required securement patterns for insulation and roofing system.
- D. Contractor shall provide a "Final Statement of Compliance" to the Architect, which states that the finished roof membrane complies with the approved contractual documents.

EXHIBIT "A"

- E. The roof membrane shall be inspected by the manufacturer's representative within one year of acceptance of the roof membrane by the City of Fernandina Beach.
- F. Installer Qualifications: Company specializing in performing the work of this section with minimum 5 years experience and approved by manufacturer.

1.06 APPROVED ROOFING SUB-CONTRACTORS

- A. Only the following approved Roofing Sub-Contractors may perform on this project.
- B. BBG Contracting Group, Inc., Jacksonville, Florida, 904-425-6619
- C. Childers Roofing Co., Inc., Jacksonville, Florida, 904-696-8550
- D. McCurdy-Waden, Inc., Jacksonville, Florida, 904-783-9000
- E. Barber & Associates, Inc., Jacksonville, Florida, 904-744-4067

1.07 PRE-INSTALLATION MEETING

- A. Convene one week before starting work of this section.
- B. Review preparation and installation procedures and coordinating and scheduling required with related work.

1.08 DELIVERY, STORAGE, AND HANDLING

- A. Deliver products in manufacturer's original containers, dry, undamaged, with seals and labels intact.
- B. Store products in weather protected environment, clear of ground and moisture; ballast materials may be stored outdoors.
- C. Protect foam insulation from direct exposure to sunlight.

1.09 FIELD CONDITIONS

- A. Coordinate the work with installation of associated flashings and counterflashings installed by other sections as the work of this section proceeds.
- B. Do not apply roofing membrane when environmental conditions are outside the ranges recommended by manufacturer.
- C. Do not expose materials vulnerable to water or sun damage in quantities greater than can be weatherproofed the same day.

1.10 WARRANTY

- A. See Section 01 78 00 - Closeout Submittals, for additional warranty requirements.
- B. Correct defective Work within a two year period after Date of Substantial Completion.
- C. Provide 20 year manufacturer's material and labor warranty to cover failure to prevent penetration of water.

PART 2 PRODUCTS

2.01 MANUFACTURERS - Siplast Systems Florida Product Approval and NOA No. 09-0901.14

- A. Membrane Materials provide at modification to exiting roof areas:
 - 1. Two ply SBS systems with 2-ply SBS flashing system utilizing metalclad flashing cap sheet. System will be mechanically fastened/cold adhesive applied.
 - 2. Systems Acceptable: Cold Adhesive Application
 - a. Existing Roof Modifications. Siplast: www.siplast.com. Design Basis: Siplast 2030

EXHIBIT "A"

CBA/IA. Provide 1/2 inch cover board mechanically attached as indicated. Paradiene 20 inner ply sheet and Paradiene 30FR Cap Sheet, PA 311 cold adhesive and Veral Aluminum Faced Torched Flashing. Siplast: Telephone 904-296-1999.

- b. New Roof on new construction areas: Siplast:
- 3. Substitutions: See Section 01 60 00 - Product Requirements.

B. Insulation:

- 1. Manville
- 2. Dow Chemical Co: www.dow.com.
- 3. Paratherm by Siplast/Icopal.
- 4. Substitutions: See Section 01 60 00 - Product Requirements.

2.02 ROOFING - CONVENTIONAL APPLICATION

- A. Modified Bituminous Roofing: Two-ply membrane, with insulation.
- B. Roofing Assembly Requirements:
 - 1. External Fire Exposure Classification: ASTM E108 Class A, UL or Warnock Hersey listed.
 - 2. Wind Resistance Classification: System must be listed in current product approval listing: Factory Mutual, in accordance with FM DS 1-28.
 - 3. Insulation Thermal Value (R), minimum: R-40 at new construction roof areas, R-38 at existing construction reroofed areas, and match combined thickness of insulation at new equipment locations in existing roof areas; provide insulation of thickness required.
- C. Acceptable Insulation Types - Constant Thickness Application:
 - 1. Minimum 2 layers of polyisocyanurate board.
- D. Acceptable Insulation Types - Tapered Application: Tapered Insulation required at crickets and wall interface to direct drainage to gutters.
 - 1. Tapered perlite or extruded polystyrene board crickets.
- E. Surfacing: Aggregate Granular surface.

2.03 MEMBRANE AND SHEET MATERIALS

- A. Roofing Membrane Assembly: A roof membrane assembly consisting of two plies of a prefabricated, reinforced, homogeneous Styrene-Butadiene-Styrene (SBS) block copolymer modified asphalt membrane, applied over a prepared substrate. Reinforcement mats shall be impregnated/saturated and coated each side with SBS modified bitumen blend. The cross sectional area of the sheet material shall contain no oxidized or non-SBS modified bitumen. The roof system shall pass 500 cycles of ASTM D 5849 Resistance to Cyclic Joint Displacement (fatigue) at 14°F (-10°C). Passing results shall show no signs of membrane cracking or interply delamination after 500 cycles. The roof system shall pass 200 cycles of ASTM D 5849 after heat conditioning performed in accordance with ASTM D 5147. The assembly shall possess waterproofing capability, such that a phased roof application, with only the modified bitumen base ply in place, can be achieved for prolonged periods of time without detriment to the watertight integrity of the entire roof system.
 - 1. Siplast Paradiene 20/30 FR roof system
 - 2. Modified Bitumen Base and Stripping Ply
 - a. Thickness (avg): 91 mils (2.3 mm) (ASTM D 5147)
 - b. Thickness (min): 87 mils (2.2 mm) (ASTM D 5147)
 - c. Weight (min per 100 ft² of coverage): 62 lb (3.0 kg/m²)
 - d. Maximum filler content in elastomeric blend - 35% by weight
 - e. Low temperature flexibility @ -15°F (-26°C): PASS (ASTM D 5147)
 - f. Peak Load (avg) @ 73°F (23°C): 30 lbf/inch (5.3 kN/m) (ASTM D 5147)
 - g. Peak Load (avg) @ 0°F (-18°C): 70 lbf/inch (12.3 kN/m) (ASTM D 5147)
 - h. Ultimate Elongation (avg.) @ 73°F (23°C): 50% (ASTM D 5147)

EXHIBIT "A"

- i. Dimensional Stability (max): 0.1% (ASTM D 5147)
 - j. Compound Stability (min): 250°F (121°C) (ASTM D 5147)
 - k. Approvals: UL Class listed, FM Approved (products shall bear seals of approval)
 - l. Reinforcement: fiberglass mat or other meeting the performance and dimensional stability criteria
 - 1) Siplast Paradiene 20
3. Modified Bitumen Finish Ply
- a. Thickness (avg): 110 mils (2.8 mm) (ASTM D 5147)
 - b. Thickness at selvage (coating thickness) (avg): 98 mils (2.5 mm) (ASTM D 5147)
 - c. Thickness at selvage (coating thickness) (min): 94 mils (2.4 mm) (ASTM D 5147)
 - d. Weight (min per 100 ft² of coverage): 75 lb (3.6 kg/m²)
 - e. Maximum filler content in elastomeric blend: 35% by weight
 - f. Low temperature flexibility @ -15°F (-26°C): PASS (ASTM D 5147)
 - g. Peak Load (avg) @ 73°F (23°C): 30 lbf/inch (5.3 kN/m) (ASTM D 5147)
 - h. Peak Load (avg) @ 0°F (-18°C): 75 lbf/inch (13.2 kN/m) (ASTM D 5147)
 - i. Ultimate Elongation (avg.) @ 73°F (23°C): 55% (ASTM D 5147)
 - j. Dimensional Stability (max): 0.1% (ASTM D 5147)
 - k. Compound Stability (min): 250°F (121°C) (ASTM D 5147)
 - l. Approvals: UL Class listed (product shall bear seals of approval)
 - m. Reinforcement: fiberglass mat or other meeting the performance and dimensional stability criteria
 - n. Surfacing: granular
 - 1) Siplast Paradiene 30 FR
- B. Flashing Membrane Assembly: A flashing membrane assembly consisting of a prefabricated, reinforced, Styrene-Butadiene-Styrene (SBS) block copolymer modified asphalt membrane with a continuous, channel-embossed metal-foil surfacing. The finish ply shall conform to ASTM D 6298 and the following physical and mechanical property requirements.
- 1. Siplast Veral flashing system, aluminum finish
 - 2. Cant Backing Sheet and Flashing Reinforcing Ply
 - a. Thickness (avg): 102 mils (2.6 mm) (ASTM D 5147)
 - b. Thickness (min): 98 mils (2.5 mm) (ASTM D 5147)
 - c. Weight (min per 100 ft² of coverage): 72 lb (3.5 kg/m²)
 - d. Maximum filler content in elastomeric blend: 35% by weight
 - e. Low temperature flexibility @ -15° F (-26° C) - PASS (ASTM D 5147)
 - f. Peak Load (avg) @ 73°F (23°C): 30 lbf/inch (5.3 kN/m) (ASTM D 5147)
 - g. Peak Load (avg) @ 0°F (-18°C): 75 lbf/inch (13.2 kN/m) (ASTM D 5147)
 - h. Ultimate Elongation (avg.) @ 73°F (23°C): 50% (ASTM D 5147)
 - i. Dimensional Stability (max): 0.1% (ASTM D 5147)
 - j. Compound Stability (min - sheet): 250°F (121°C) (ASTM D 5147)
 - k. Compound Stability (min - adhesive coating): 212°F (100°C) (ASTM D 5147)
 - l. Approvals: UL Class listed, FM Approved (products shall bear seals of approval)
 - m. Reinforcement: fiberglass mat or other meeting the performance and dimensional stability criteria
 - n. Back Surfacing: polyolefin film
 - 1) Siplast Paradiene 20 SA
 - 3. Metal-Clad Modified Bitumen Flashing Sheet
 - a. Thickness (avg): 142 mils (3.6 mm) (ASTM D 5147)
 - b. Thickness (min): 138 mils (3.5 mm) (ASTM D 5147)
 - c. Weight (min per 100 ft² of coverage): 92 lb (4.5 kg/m²)
 - d. Coating Thickness - back surface (min): 40 mils (1 mm) (ASTM D 5147)
 - e. Low temperature flexibility @ 0° F (-18° C): PASS (ASTM D 5147)
 - f. Peak Load (avg) @ 73°F (23°C): 85 lbf/inch (15 kN/m) (ASTM D 5147)
 - g. Peak Load (avg) @ 0°F (-18°C): 180 lbf/inch (31.7 kN/m) (ASTM D 5147)

EXHIBIT "A"

- h. Ultimate Elongation (avg) @ 73°F (23°C): 45% (ASTM D 5147)
 - i. Tear-Strength (avg): 120 lbf (0.54 kN) (ASTM D 5147)
 - j. Dimensional Stability (max): 0.2% (ASTM D 5147)
 - k. Compound Stability (min): 225°F (107°C) (ASTM D 5147)
 - l. Cyclic Thermal Shock Stability (maximum): 0.2% (ASTM D 7051)
 - m. Approvals: UL Approved, FM Approved (products shall bear seals of approval)
 - n. Reinforcement: fiberglass scrim mat or other meeting the performance and dimensional stability criteria
 - o. Surfacing: aluminum metal foil
 - 1) Siplast Veral Aluminum
- C. Liquid Flashing System: Option for non-parapet areas. Provide at new penetrations of existing roof areas for new piping or equipment. Liquid polyurethane/bitumen resin waterproofing flashing and roofing system compatible with other roofing and construction materials to be used in selected areas indicated to create transition from new roofing and existing or new flashing, curbs or construction materials to remain.
- 1. Catalyzed Acrylic Resin Flashing System: A specialty flashing system consisting of a liquid-applied, fully reinforced, multi-component acrylic membrane installed over a prepared or primed substrate. The flashing system consists of a catalyzed acrylic resin primer, basecoat and topcoat, combined with a non-woven polyester fleece. The resin and catalyst are pre-mixed immediately prior to installation. The use of the specialty flashing system shall be specifically approved in advance by the membrane manufacturer for each application.
 - a. Parapro 123 Flashing System by Siplast; Irving, TX

2.04 BITUMINOUS MATERIALS

- A. Primer: ASTM D41, asphalt type.
- B. Adhesive: PA-311 cold application asphalt adhesive. ASTM D 4586 Type II.
- C. Roof Cement: ASTM D4586, Type II.

2.05 DECK SHEATHING (Cover Board) Mechanically attached Cover Board must meet 130 MPH wind anchor condition.

- A. Deck Sheathing: Glass mat faced gypsum panels, ASTM C 1177/C 1177M, fire resistant type, 1/2 inch thick. Design Basis: Dens-Deck by Georgia-Pacific.

2.06 INSULATION

- A. Polyisocyanurate Board Insulation: Rigid cellular foam, complying with ASTM C 1289, and with the following characteristics: (Mechanically Attached)
 - 1. Compressive Strength: 16 psi
 - 2. Facing: Asphalt felt or mat both faces.
 - 3. Board Size: 48 x 96 inch.
 - 4. Board Thickness: 6 1/2 inch at new building area and 3 1/2 inch at reroofing area.
 - 5. Tapered Board: Slope as indicated; minimum thickness 3 1/2 inch; fabricate of fewest layers possible.
 - 6. Thermal Resistance: R-value of 40 at new construction area roof and combined R38 at existing reroof area.
 - 7. Board Edges: Square.

2.07 SURFACING MATERIALS

- A. Walkway Pads: Bitumen-impregnated mineral fiber boards with granular surfaces, compatible with roofing materials.
 - 1. Size: 39x26 inch.

EXHIBIT "A"

2. Product: Manufactured by Roofing Manufacturer.

2.08 ACCESSORIES

- A. Cant and Edge Strips: Perlite board, compatible with roofing materials; cants formed to 45 degree angle.
- B. Sheathing Joint Tape: Heat resistant type, 3 inch wide, self adhering.
- C. Insulation Joint Tape: Glass fiber reinforced type as recommended by insulation manufacturer, compatible with roofing materials; 6 inches wide; self adhering.
- D. Insulation Fasteners: Appropriate for purpose intended and approved by roofing manufacturer.
 1. Length as required for thickness of insulation material and penetration of deck substrate, with metal washers.
- E. Strip Reglet Devices: Galvanized steel, maximum possible lengths per location, with attachment flanges.
- F. Pipe and Support Roof Penetrations: manufacturers recommended system.
- G. Sealants: As recommended by membrane manufacturer.

PART 3 EXECUTION

3.01 REMOVAL OF SELECTED EXISTING BUILT-UP ROOFING, FLASHING

- A. Remove and dispose off-site of selected existing built-up gravel roof and modified bitumum membranes, miscellaneous membrane, selected flashings, and roof curbs as well as damaged wood nailers in a manner that protects on-going user activity and facilities from damage or interruptions other than scheduled work interface.
 1. Remove existing gravel ballast with mechanical spudding machine and handwork detail to protect existing roofing membrane to serve as continuous base for new re-roofing work.
 2. Maintain waterproof protection during all re-roofing operations.
- B. Inspect existing metal deck, rigid insulation, and wood nailers to determine any additional extent of removal, repair or replacement that is required, other than those locations indicated on drawings to be replaced.
- C. Provide temporary cover over all roof work areas than are not reroofed in a given days work.
- D. All replacement insulation, nailers, roofing and flashing shall meet current FBC requirements for R 38 insulation and 130 MPH wind region.

3.02 EXAMINATION

- A. Verify that surfaces and site conditions are ready to receive work.
- B. Verify deck is supported and secure.
- C. Verify deck is clean and smooth, flat, free of depressions, waves, or projections, properly sloped and suitable for installation of roof system.
- D. Verify deck surfaces are dry and free of snow or ice.
- E. Verify that roof openings, curbs, and penetrations through roof are solidly set, and cant strips are in place.

3.03 METAL DECK PREPARATION

- A. Install all roofing in accord with specified system for 130 MPH wind requirements.
- B. Install deck cover board over rigid insulation on metal deck:
 1. Lay with long side at right angle to flutes; stagger end joints; provide support at ends.

EXHIBIT "A"

2. Cut cover board cleanly and accurately at roof breaks and protrusions to provide smooth surface.
3. Tape joints.
4. Mechanically fasten cover board over rigid insulation to metal roof deck, in accordance with Factory Mutual recommendations and roofing manufacturer's instructions.

3.04 VAPOR RETARDER INSTALLATION (Required if roof deck is exposed prior to reroofing)

- A. Mopped Two-ply Vapor Retarder:
 1. Apply primer at a rate of 1 gal/square and allow to dry.
 2. Mop surface with hot bitumen and embed two plies of vapor retarder felt; lap plies 19 inches, full mop each ply.
 3. Apply bitumen at 20 lb/square.
 4. Glaze top surface of the vapor retarder with bitumen if insulation is not placed immediately.
- B. Extend vapor retarder under cant strips and blocking.
- C. Install flexible flashing from vapor retarder to air seal material of wall construction, lap and seal to provide continuity of the air barrier plane.

3.05 INSULATION INSTALLATION - CONVENTIONAL APPLICATION

- A. Ensure vapor retarder is clean and dry, continuous, and ready for application of roofing system.
- B. Attachment of Insulation: Mechanically fasten insulation to deck through 1/2 inch thick cover board in accordance with roofing manufacturer's instructions and Factory Mutual requirements.
 1. Use fastener type and fastening pattern as required to achieve wind resistance specified.
- C. Lay subsequent layers of insulation with joints staggered minimum 6-inch from joints of preceding layer.
- D. Place tapered insulation to the required slope pattern in accordance with manufacturer's instructions.
- E. On metal deck, place boards parallel to flutes with insulation board edges bearing on deck flutes.
- F. Lay boards with edges in moderate contact without forcing. Cut insulation to fit neatly to perimeter blocking and around penetrations through roof.
- G. Tape joints of insulation, if required, in accordance with insulation manufacturer's instructions.
- H. At roof drains, use factory-tapered boards to slope down to roof drains over a distance of 18 inches.
- I. Do not apply more insulation than can be covered with membrane in same day.

3.06 MEMBRANE APPLICATION

- A. Apply membrane in accordance with manufacturer's instructions.
- B. Apply membrane; lap and seal edges and ends permanently waterproof.
- C. Apply smooth, free from air pockets, wrinkles, fish-mouths, or tears. Ensure full bond of membrane to substrate.
- D. At end of day's operation, install waterproof cut-off. Remove cut-off before resuming roofing.
- E. At intersections with vertical surfaces:
 1. Extend membrane over cant strips and up a minimum of 8 inches onto vertical surfaces.
 2. Apply flexible flashing over membrane.
 3. Insert base flashing into reglets and secure.
- F. At gravel stops, extend membrane and base sheet under gravel stop and to the outside face of

EXHIBIT "A"

the wall.

- G. Around roof penetrations, mop in and seal flanges and flashings with flexible flashing.

3.07 RE-ROOFING EXISTING ROOF AREAS

- A. New re-roofing system shall be as specified for new roof areas.
- B. Remove and reflash any selected existing metal, expansion joints, copings, curb flashing, equipment flashing. Remove all existing flexible flashings and provide new aluminum faced or liquid flashings as indicated on drawings. Flash all new equipment.
- C. Remove, fill voids and roof over all existing roof ventilation units.
- D. Paint with corrosive resistant aluminum paint all existing galvanized metal roof top mechanical units indicated to remain. Anchor existing loose bird-screen or replace if missing.
- E. Provide new aluminum conduit devices as detailed, at existing electrical conduit roof penetrations scheduled to be rewired.

3.08 FIELD QUALITY CONTROL

- A. See Section 01 40 00 - Quality Requirements, for general requirements for field quality control and inspection.
- B. Require site attendance of roofing material manufacturers technical service representative once during installation of the Work and once at completion.

3.09 CLEANING

- A. Remove bituminous markings from finished surfaces.
- B. In areas where finished surfaces are soiled by bitumen or other source of soiling caused by work of this section, consult manufacturer of surfaces for cleaning advice and conform to their documented instructions.
- C. Repair or replace defaced or damaged finishes caused by work of this section.

3.10 PROTECTION

- A. Protect installed roofing and flashings from construction operations.
- B. Where traffic must continue over finished roof membrane, protect surfaces using durable materials.

END OF SECTION

SECTION 07 62 00

SHEET METAL FLASHING AND TRIM

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Fabricated sheet metal items, including flashings, counterflashings, downspouts, and scuppers and conductor heads.
- B. Reglets and accessories.
- C. Sheetmetal splash pans.
- D. Precast concrete splash pads.
- E. Removal and new material replacement of existing roof metal flashings in project work areas. Provide new installation meeting current code anchoring patterns installation procedures.

1.02 REFERENCE STANDARDS

- A. AAMA 611 - Voluntary Specification for Anodized Architectural Aluminum; American Architectural Manufacturers Association; 2012.
- B. AAMA 2605 - Voluntary Specification, Performance Requirements and Test Procedures for Superior Performing Organic Coatings on Aluminum Extrusions and Panels; 2011.
- C. ASTM B209 - Standard Specification for Aluminum and Aluminum-Alloy Sheet and Plate; 2010.
- D. ASTM D2178 - Standard Specification for Asphalt Glass Felt Used in Roofing and Waterproofing; 2004.
- E. ASTM D4586/D4586M - Standard Specification for Asphalt Roof Cement, Asbestos-Free; 2007 (Reapproved 2012)e1.
- F. SMACNA (ASMM) - Architectural Sheet Metal Manual; Sheet Metal and Air Conditioning Contractors' National Association; 2003.

1.03 SUBMITTALS

- A. See Section 01 30 00 - Administrative Requirements, for submittal procedures.
- B. Shop Drawings: Indicate material profile, jointing pattern, jointing details, fastening methods, flashings, terminations, and installation details.
- C. Provide FBC 2010, Product Approval, NOA or Dade County Certificate of Approval for Flashing work for wind zone approximately 130 MPH, as show on Structural Wind Diagram.
- D. Samples: Submit two samples 2 x 2 inch in size illustrating metal finish color.

1.04 QUALITY ASSURANCE

- A. Perform work in accordance with SMACNA Architectural Sheet Metal Manual requirements and standard details, except as otherwise indicated.
- B. Fabricator and Installer Qualifications: Company specializing in sheet metal work with 5 years of documented experience.

1.05 PRE-INSTALLATION CONFERENCE

- A. Convene one week before starting work of this section.

1.06 DELIVERY, STORAGE, AND HANDLING

EXHIBIT "A"

- A. Stack material to prevent twisting, bending, and abrasion, and to provide ventilation. Slope metal sheets to ensure drainage.
- B. Prevent contact with materials that could cause discoloration or staining.

PART 2 PRODUCTS

2.01 SHEET MATERIALS

- A. Aluminum: ASTM B209 (ASTM B209M); 0.040 inch thick; anodized finish of color as selected.
 - 1. Clear Anodized Finish: (Concealed Roofing areas) AAMA 611 AA-M12C22A41 Class I clear anodic coating not less than 0.7 mils thick.
 - 2. Color Anodized Finish: Exposed to View areas. Medium Bronze color. (Existing replacement areas to match medium bronze color) AAMA 611 AA-M12C22A42/44 Class I integrally or electrolytically colored anodic coating not less than 0.7 mils thick.

2.02 PREFABRICATED METAL COPING AT PARAPET WALLS

- A. Parapet Wall Coping will be Permasnap Plus Parapet Wall Coping as manufactured by Hickman. Assembly to provide 16 gage galvanized steel cleat for FM1-180 Wind Storm Rating and 130 MPH warrantee. Coping finish shall be Medium Bronze Anodized 0.063 Aluminum with gutter chairs and concealed splice plates in 10 foot lengths to fit wall width of approximately 14 1/2 inches.

2.03 ACCESSORIES

- A. Fasteners: Stainless steel, with soft neoprene washers.
- B. Underlayment: ASTM D2178, glass fiber roofing felt.
- C. Primer: Zinc chromate type.
- D. Protective Backing Paint: Zinc molybdate alkyd.
- E. Sealant: Type specified in Section 07 90 05.
- F. Plastic Cement: ASTM D4586, Type I.
- G. Reglets: Surface mounted type, galvanized steel; face and ends covered with plastic tape.

2.04 FABRICATION

- A. Form sections true to shape, accurate in size, square, and free from distortion or defects.
- B. Fabricate cleats of aluminum type sheet metal, minimum 3 inches wide, interlocking with sheet. Provide continuous cleats at roof edge and eave flashings.
- C. Form pieces in longest possible lengths.
- D. Hem exposed edges on underside 1/2 inch; miter and seam corners.
- E. Form material with flat lock seams, except where otherwise indicated. At moving joints, use sealed lapped, bayonet-type or interlocking hooked seams.
- F. Fabricate corners from one piece with minimum 18 inch long legs; seam for rigidity, seal with sealant.
- G. Fabricate vertical faces with bottom edge formed outward 1/4 inch (6 mm) and hemmed to form drip.
- H. Fabricate flashings to allow toe to extend 2 inches over roofing. Return and brake edges.

2.05 DOWNSPOUT AND CONDUCTOR HEAD/SCUPPER FABRICATION

EXHIBIT "A"

- A. Downspouts: Square profile.
- B. Downspouts: Size for rainfall intensity determined by a storm occurrence of 1 in 5 years in accordance with SMACNA Architectural Sheet Metal Manual.
- C. Accessories: Profiled to suit gutters and downspouts.
 - 1. Anchorage Devices: In accordance with SMACNA requirements.
 - 2. Conductor Head Supports: Brackets.
 - 3. Downspout Supports: Brackets.
- D. Splash Pans: Same metal type as downspouts, formed to 16x24 inches size; rolled sides of 2 inch high for inverted pan placement.
- E. Splash Pads: Precast concrete type, of size and profiles indicated; minimum 3000 psi at 28 days, with minimum 5 percent air entrainment.
- F. Conductor Heads and Scuppers to match SMACNA recommendations and be of size indicated on drawings.
- G. Seal metal joints.

PART 3 EXECUTION

3.01 REMOVAL AND REINSTALLATION OF SELECTED EXISTING FLASHINGS, SCUPPERS, CONDUCTOR HEADS AND DOWNSPOUTS

- A. Remove and replace selected existing roof flashings, and downspouts in a manner that protects existing user activity and facilities from damage or interruption other than scheduled interruptions.
- B. Disposal off site of removed damaged flashing, nailer and other debris as required.
- C. Inspect existing nailers to determine if additional wood nailer replacement is required other than that indicated on drawings.
- D. Installation and replacement of existing flashings shall meet FBC requirements for 130 MPH wind-blown debris region.

3.02 EXAMINATION

- A. Verify roof openings, curbs, pipes, sleeves, ducts, and vents through roof are solidly set, reglets in place, and nailing strips located.
- B. Verify roofing termination and base flashings are in place, sealed, and secure.

3.03 PREPARATION

- A. Install starter and edge strips, and cleats before starting installation.
- B. Install surface mounted reglets true to lines and levels. Seal top of reglets with sealant.
- C. Back paint concealed metal surfaces with protective backing paint to a minimum dry film thickness of 15 mil.

3.04 INSTALLATION

- A. Insert flashings into reglets to form tight fit. Secure in place with lead wedges. Seal flashings into reglets with sealant.
- B. Secure flashings in place using concealed fasteners. Use exposed fasteners only where permitted.
- C. Apply plastic cement compound between metal flashings and felt flashings.
- D. Fit flashings tight in place. Make corners square, surfaces true and straight in planes, and lines

EXHIBIT "A"

accurate to profiles.

- E. Seal metal joints watertight.
- F. Set splash pans and pads under downspouts.

END OF SECTION

SECTION 07 72 00

ROOF ACCESSORIES

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Manufactured curbs.
- B. New Roof Curb Extension to existing raised Roof hatch.
- C. OSHA compliant protecting rail/gate system.
- D. Pipe, Duct and Conduit mounting pedestals.

1.02 REFERENCE STANDARDS

- A. ASTM A123/A123M - Standard Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products; 2012.
- B. ASTM A153/A153M - Standard Specification for Zinc Coating (Hot-Dip) on Iron and Steel Hardware; 2009.
- C. ASTM A653/A653M - Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process; 2011.
- D. MSS SP-58 - Pipe Hangers and Supports - Materials, Design, Manufacture, Selection, Application, and Installation; Manufacturers Standardization Society of the Valve and Fittings Industry, Inc.; 2009.

1.03 SUBMITTALS

- A. See Section 01 30 00 - Administrative Requirements, for submittal procedures.
- B. All Roofing products must have Florida Product Approval Certification or NOA meeting FBC requirements for approximately 130 MPH (Vult.) wind condition as indicated on Structural Wind Diagram.
- C. Product Data: Manufacturer's data sheets on each product to be used.
 - 1. Preparation instructions and recommendations.
 - 2. Storage and handling requirements and recommendations.
 - 3. Installation methods.
 - 4. Maintenance requirements.

1.04 DELIVERY, STORAGE, AND HANDLING

- A. Store products in manufacturer's unopened packaging until ready for installation.
- B. Store products under cover and elevated above grade.

PART 2 PRODUCTS

2.01 MANUFACTURED CURBS

- A. Manufactured Curbs, and Other Roof Mounting Assemblies:
 - 1. AES Manufacturing Inc.: www.aescurb.com.
 - 2. The Pate Company: www.patecurbs.com.
 - 3. Roof Products & Systems (RPS) by Commercial Products Group of Hart & Cooley, Inc: www.rpscurs.com.
 - 4. Substitutions: See Section 01 60 00 - Product Requirements.
- B. Manufactured Curbs, and Other Roof Mounting Assemblies: Factory-assembled hollow sheet

EXHIBIT "A"

metal construction with fully mitered and welded corners, integral counterflashing, internal reinforcing, and top side and edges formed to shed water.

1. Sheet Metal: Hot-dip zinc coated steel sheet complying with ASTM A653/A653M, SS Grade 33 ; G60 coating designation; 18 gage, 0.048 inch thick.
 2. Roofing Cants: Provide integral sheet metal roofing cants dimensioned to begin slope at top of roofing insulation; 1:1 slope; minimum cant height 4 inches.
 3. Manufacture curb bottom and mounting flanges for installation directly on roof deck, not on insulation; match slope and configuration of roof deck to provide level top on sloped deck.
 4. Provide the layouts and configurations shown on the drawings.
 5. Provide curbs for thru-bolt connection thru curb between equipment and building structure below as indicated on mechanical and structural drawings.
- C. Curbs Adjacent to Roof Openings: Provide curb on all sides of opening, with top of curb horizontal for equipment mounting.
1. Provide curb extensions to raise existing equipment curbs or replace curb to fit new roof thickness.
 2. See mechanical for size and tapered height of new HVAC roof top unit curbs.
 3. Taper all curbs to fit roof slope and provide a horizontal equipment mounting frame.
 4. Provide new insulated roof curbs at all new or relocated roof equipment areas.
 5. Provide preservative treated wood nailers along top of curb.
 6. Insulate inside curbs with 1-1/2 inch thick fiberglass insulation.
 7. Height Above Finished Roof Surface: 12 inches, minimum.
 8. Height Above Roof Deck: 19 inches, minimum.
- D. Equipment Rails: Two-sided curbs in straight lengths, with top horizontal for equipment mounting.
1. Provide preservative treated wood nailers along top of rails.
 2. Height Above Finished Roof Surface: 12 inches, minimum.
 3. Height Above Roof Deck: 19 inches, minimum.
- E. Pipe, Duct, and Conduit Mounting Pedestals: Vertical posts, minimum 4 inches square unless otherwise indicated.
1. Provide sliding channel welded along top edge with adjustable height steel bracket, manufactured to fit item supported.
 2. Height to accommodate location and height of ductwork or piping.
 3. Height Above Finished Roof Surface: 12 inches, minimum.
 4. Height Above Roof Deck: 18 inches, minimum.

2.02 EXISTING ROOF HATCH AND ACCESS LADDER.

- A. CURB EXTENSION COLLAR; Provide compatible curb extension to raise curb a minimum of 12 inches above new roof level. Extend ladder one rung to fit curb height.

2.03

A. NON-PENETRATING ROOFTOP ASSEMBLIES

1. Non-Penetrating Rooftop Assemblies: Manufacturer-engineered and factory-fabricated, with pedestal bases that rest on top of roofing membrane, not requiring any attachment to the roof structure and not penetrating the roofing assembly.
 - a. Design Loadings and Configurations: As required by applicable codes.
 - b. Height: Provide minimum clearance of 12 inches under supported items to top of roofing.
 - c. Support Spacing and Base Sizes: As required to distribute load sufficiently to prevent indentation of roofing assembly.
 - d. Steel Components: Stainless steel, or carbon steel hot-dip galvanized after fabrication in accordance with ASTM A123/A123M.
 - e. Hardware, Bolts, Nuts, and Washers: Stainless steel, or carbon steel hot-dip

EXHIBIT "A"

- galvanized after fabrication in accordance with ASTM A153/A153M.
2. Pipe Supports: Provide attachment fixtures complying with MSS SP-58 and as indicated.
 3. Duct Supports:
 4. Conduit and Cable Tray Supports:
 5. Non-Penetrating Pedestals: Steel pedestals with square, round, or rectangular bases.
 - a. Bases: High density polypropylene.
 - b. Base Sizes: As required to distribute load sufficiently to prevent indentation of roofing assembly.
 - c. Steel Components: Stainless steel, or carbon steel hot-dip galvanized after fabrication in accordance with ASTM A123/A123M.
 6. Provide a new OSHA compliant roof hatch opening railing/gate system at existing roof hatch.
 - a. Metal or plastic pipe system.
 - b. Anchor to brackets on roof hatch.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Do not begin installation until substrates have been properly prepared.
- B. If substrate preparation is the responsibility of another installer, notify Architect of unsatisfactory preparation before proceeding.

3.02 PREPARATION

- A. Clean surfaces thoroughly prior to installation.
- B. Prepare surfaces using the methods recommended by the manufacturer for achieving the best result for the substrate under the project conditions.

3.03 INSTALLATION

- A. Install in accordance with manufacturer's instructions, in manner that maintains roofing weather integrity.

3.04 PROTECTION

- A. Clean installed work to like-new condition.
- B. Protect installed products until completion of project.
- C. Touch-up, repair or replace damaged products before Substantial Completion.

END OF SECTION

SECTION 07 84 00

FIRESTOPPING

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Firestopping systems.
- B. Firestopping of all joints and penetrations in fire-resistance rated and smoke-resistant assemblies, whether indicated on drawings or not, and other openings indicated.
- C. Provide Firestopping materials at all voids between all non-fire rated full height partitions, or exterior walls, and underside of metal roof deck to retard sound, air or moisture migration between separate areas. Fire rating is not required in these locations.

1.02 REFERENCE STANDARDS

- A. ASTM E814 - Standard Test Method for Fire Tests of Through-Penetration Fire Stops; 2011a.
- B. ITS (DIR) - Directory of Listed Products; Intertek Testing Services NA, Inc.; current edition.
- C. FM 4991 - Approval of Firestop Contractors; Factory Mutual Research Corporation; 2001.
- D. FM P7825 - Approval Guide; Factory Mutual Research Corporation; current edition.
- E. UL (FRD) - Fire Resistance Directory; Underwriters Laboratories Inc.; current edition.

1.03 SUBMITTALS

- A. See Section 01 30 00 -Administrative Requirements, for submittal procedures.
- B. Schedule of Firestopping: List each type of penetration.
- C. Product Data: Provide data on product characteristics.
- D. FGBC Report: Submit VOC content documentation for all non-preformed materials.
- E. Manufacturer's Installation Instructions: Indicate preparation and installation instructions.
- F. Manufacturer's Certificate: Certify that products meet or exceed specified requirements.

1.04 QUALITY ASSURANCE

- A. Fire Testing: Provide firestopping assemblies of designs that provide the scheduled fire ratings when tested in accordance with methods indicated.
 - 1. Listing in the current-year classification or certification books of UL, FM, or ITS (Warnock Hersey) will be considered as constituting an acceptable test report.
 - 2. Current evaluation reports published by CABO, ICBO, or BOCA will be considered as constituting an acceptable test report.
 - 3. Submission of actual test reports is required for assemblies for which none of the above substantiation exists.
- B. Manufacturer Qualifications: Company specializing in manufacturing the products specified in this section with minimum three years documented experience.
- C. Installer Qualifications: Company specializing in performing the work of this section and:
 - 1. Approved by Factory Mutual Research under FM Standard 4991, Approval of Firestop Contractors, or meeting any two of the following requirements:.
 - 2. With minimum 3 years documented experience installing work of this type.
 - 3. Licensed by authority having jurisdiction.
 - 4. Approved by firestopping manufacturer.

EXHIBIT "A"

1.05 FIELD CONDITIONS

- A. Comply with firestopping manufacturer's recommendations for temperature and conditions during and after installation. Maintain minimum temperature before, during, and for 3 days after installation of materials.
- B. Provide ventilation in areas where solvent-cured materials are being installed.

PART 2 PRODUCTS

2.01 FIRESTOPPING - GENERAL REQUIREMENTS

- A. Primers, Sleeves, Forms, Insulation, Packing, Stuffing, and Accessories: Type required for tested assembly design.

2.02 FIRESTOPPING SYSTEMS

- A. Firestopping: Any material meeting requirements.
 - 1. Fire Ratings: Use any system listed by UL or tested in accordance with ASTM E814 that has F Rating equal to fire rating of penetrated assembly and minimum T Rating Equal to F Rating and that meets all other specified requirements.
 - 2. Fire Rating Requirements are indicated on drawings for 1 hour wall assemblies at locations shown.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Verify openings are ready to receive the work of this section.

3.02 PREPARATION

- A. Clean substrate surfaces of dirt, dust, grease, oil, loose material, or other matter that could adversely affect bond of firestopping material.
- B. Remove incompatible materials that could adversely affect bond.
- C. Install backing materials to arrest liquid material leakage.

3.03 INSTALLATION

- A. Install materials in manner described in fire test report and in accordance with manufacturer's instructions, completely closing openings.
- B. Do not cover installed firestopping until inspected by authority having jurisdiction.
- C. Install labeling required by code.

3.04 PROTECTION

- A. Clean adjacent surfaces of firestopping materials.
- B. Protect adjacent surfaces from damage by material installation.

END OF SECTION

SECTION 07 90 05

JOINT SEALERS

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Sealants and joint backing.
- B. Precompressed foam sealers.
- C. Hollow gaskets.

1.02 REFERENCE STANDARDS

- A. ASTM C834 - Standard Specification for Latex Sealants; 2010.
- B. ASTM C919 - Standard Practice for Use of Sealants in Acoustical Applications; 2012.
- C. ASTM C920 - Standard Specification for Elastomeric Joint Sealants; 2011.
- D. ASTM C1193 - Standard Guide for Use of Joint Sealants; 2011a.
- E. ASTM D1667 - Standard Specification for Flexible Cellular Materials--Poly(Vinyl Chloride) Foam (Closed-Cell); 2005 (Reapproved 2011).

1.03 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, 1 x1 inch in size illustrating sealant colors for selection.
- D. FGBC Report: Submit VOC content documentation for all non-preformed sealants and primers.
- E. Manufacturer's Installation Instructions: Indicate special procedures.

1.04 QUALITY ASSURANCE

- A. Manufacturer Qualifications: Company specializing in manufacturing the Products specified in this section with minimum three years documented experience.
- B. Applicator Qualifications: Company specializing in performing the work of this section with minimum five years experience.

1.05 FIELD CONDITIONS

- A. Maintain temperature and humidity recommended by the sealant manufacturer during and after installation.

1.06 COORDINATION

- A. Coordinate the work with all sections referencing this section.

1.07 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

2.01 MANUFACTURERS

- A. Silicone Sealants:
 1. Bostik Inc: www.bostik-us.com.
 2. Dow Corning Corp: www.dowcorning.com.
 3. GE Plastics: www.geplastics.com.
 4. Pecora Corporation: www.pecora.com.
 5. BASF Construction Chemicals-Building Systems: www.chemrex.com.
 6. Tremco, Inc: www.tremcosealants.com.
- B. Polyurethane Sealants:
 1. Bostik Inc: www.bostik-us.com.
 2. Pecora Corporation: www.pecora.com.
 3. BASF Construction Chemicals-Building Systems: www.chemrex.com.
 4. Tremco, Inc: www.tremcosealants.com.
- C. Acrylic Sealants (ASTM C920):
 1. Tremco Global Sealants: www.tremcosealants.com.
- D. Butyl Sealants:
 1. Bostik Inc: www.bostik-us.com.
 2. Pecora Corporation: www.pecora.com.
 3. Tremco, Inc: www.tremcosealants.com.
 4. Substitutions: See Section 01 60 00 - Product Requirements.
- E. Acrylic Emulsion Latex Sealants:
 1. Bostik Inc: www.bostik-us.com.
 2. Pecora Corporation: www.pecora.com.
 3. BASF Construction Chemicals-Building Systems: www.chemrex.com.
 4. Tremco, Inc: www.tremcosealants.com.
- F. Preformed Compressible Foam Sealers:
 1. EMSEAL Joint Systems, Ltd: www.emseal.com.
 2. Sandell Manufacturing Company, Inc: www.sandellmfg.com.
 3. Dayton Superior Corporation: www.daytonsuperior.com.

2.02 SEALANTS

- A. General Purpose Exterior Sealant: Polyurethane; ASTM C920, Grade NS, Class 25, Uses M, G, and A; single component.
 1. Color: Standard colors matching 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.
- B. Exterior Expansion Joint Sealer: Precompressed foam sealer; urethane with water-repellent;
 1. Color: Black.
 2. Size as required to provide weathertight seal when installed.
 3. Applications: Use for:
 - a. Exterior wall expansion joints.
- C. 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.

EXHIBIT "A"

- D. General Purpose Interior Sealant: Acrylic emulsion latex; ASTM C834, Type OP, Grade NF single component, paintable.
 - 1. Color: Standard colors matching 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. Bathtub/Tile Sealant: White silicone; ASTM C920, Uses I, M and A; single component, mildew resistant.
 - 1. Applications: Use for:
 - a. Joints between plumbing fixtures and floor and wall surfaces.
 - b. Joints between kitchen and bath countertops and wall surfaces.
- F. Acoustical Sealant for Concealed Locations:
 - 1. Applications: Use for concealed locations only:
 - a. Sealant bead between top stud runner and structure and between bottom stud track and floor.
- G. Interior Floor Joint Sealant: Polyurethane, self-leveling; ASTM C920, Grade P, Class 25, Uses T, M and A; single component.
 - 1. Approved by manufacturer for wide joints up to 1-1/2 inches.
 - 2. Color: To be selected by Architect from manufacturer's standard range.
- H. Concrete Paving Joint Sealant: Polyurethane, self-leveling; ASTM C920, Class 25, Uses T, I, M and A; single component.
 - 1. Color: Gray.
 - 2. Applications: Use for:
 - a. Joints in sidewalks and vehicular paving.

2.03 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

3.01 EXAMINATION

- A. Verify that substrate surfaces are ready to receive work.
- B. Verify that joint backing and release tapes are compatible with sealant.

3.02 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.

3.03 INSTALLATION

EXHIBIT "A"

- 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. Perform acoustical sealant application work in accordance with ASTM C919.
- D. Measure joint dimensions and size joint backers to achieve the following, unless otherwise indicated:
 - 1. Width/depth ratio of 2:1.
 - 2. Neck dimension no greater than 1/3 of the joint width.
 - 3. Surface bond area on each side not less than 75 percent of joint width.
- E. Install bond breaker where joint backing is not used.
- F. Install sealant free of air pockets, foreign embedded matter, ridges, and sags.
- G. Apply sealant within recommended application temperature ranges. Consult manufacturer when sealant cannot be applied within these temperature ranges.
- H. Tool joints concave.
- I. Precompressed Foam Sealant: Do not stretch; avoid joints except at corners, ends, and intersections; install with face 1/8 to 1/4 inch below adjoining surface.

3.04 CLEANING

- A. Clean adjacent soiled surfaces.

3.05 PROTECTION

- A. Protect sealants until cured.

END OF SECTION

SECTION 08 11 13

HOLLOW METAL DOORS AND FRAMES

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Non-fire-rated and fire-rated steel doors and frames.
- B. Six Panel embossed metal doors.
- C. Wind Load Tested doors and frames
- D. Steel frames for wood doors.
- E. Transom Frames for glazing over Metal Doors.
- F. Thermally insulated steel doors.
- G. Steel glazing frames.
- H. Accessories, including glazing and louvers.

1.02 REFERENCE STANDARDS

- A. ANSI/ICC A117.1 - American National Standard for Accessible and Usable Buildings and Facilities; International Code Council; 2009.
- B. ANSI A250.8 - SDI-100 Recommended Specifications for Standard Steel Doors and Frames; 2003.
- C. ANSI A250.10 - Test Procedure and Acceptance Criteria for Prime Painted Steel Surfaces for Steel Doors and Frames; 1998 (R2011).
- D. ASTM A653/A653M - Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process; 2011.
- E. ASTM C1363 - Standard Test Method for Thermal Performance of Building Assemblies by Means of a Hot Box Apparatus; 2011.
- F. BHMA A156.115 - Hardware Preparation in Steel Doors and Steel Frames; 2006.
- G. DHI A115 Series - Specifications for Steel Doors and Frame Preparation for Hardware; Door and Hardware Institute; 2000 (ANSI/DHI A115 Series).
- H. NAAMM HMMA 840 - Guide Specifications for Installation and Storage of Hollow Metal Doors and Frames; The National Association of Architectural Metal Manufacturers; 2007.
- I. NFPA 80 - Standard for Fire Doors and Other Opening Protectives; 2013.
- J. UL (BMD) - Building Materials Directory; Underwriters Laboratories Inc.; current edition.
- K. UL 10B - Standard for Fire Tests of Door Assemblies; Current Edition, Including All Revisions.

1.03 SUBMITTALS

- A. See Section 01 30 00 - Administrative Requirements for submittal procedures.
- B. Product Data: Materials and details of design and construction, hardware locations, reinforcement type and locations, anchorage and fastening methods, and finishes; and one copy of referenced grade standard.
- C. Shop Drawings: Details of each opening, showing elevations, glazing, frame profiles, and identifying location of different finishes, if any.

EXHIBIT "A"

- D. Installation Instructions: Manufacturer's published instructions, including any special installation instructions relating to this project.
- E. Manufacturer's Certificate: Certification that products meet or exceed specified requirements.

1.04 QUALITY ASSURANCE

- A. Manufacturer: Company specializing in manufacturing the products specified in this section with minimum three years documented experience. Manufacturer and Product must be tested for High Wind Debris Impact requirement with mandatory Yale Hardware specified.
- B. FBC 2010 product rule 9B-72 applies to products to be installed in the building envelope.
 - 1. Provide applicable Florida Building Product Approval numbers or NOA and test reports with shop drawing submittals. Applicable products without product approval numbers will not be acceptable in this project.
 - 2. Products and manufacturers include exterior walls, windows, panel walls, roofing products, shutters, skylights, structural components and other products comprising the Building's Envelope.
 - 3. Typical Building Exterior must meet 2010 FBC Wind Zone requirements for 130 MPH (Vult.) Wind Loads, as indicated on Structural Wind Diagram on drawings.

1.05 DELIVERY, STORAGE, AND HANDLING

- A. Store in accordance with NAAMM HMMA 840.
- B. Protect with resilient packaging; avoid humidity build-up under coverings; prevent corrosion.

PART 2 PRODUCTS

2.01 MANUFACTURERS

- A. Any Manufacturer who meets the requirements of this specification.

2.02 DOORS AND FRAMES

- A. Requirements for All Doors and Frames:
 - 1. Accessibility: Comply with ANSI/ICC A117.1.
 - 2. Door Top Closures: Flush with top of faces and edges.
 - 3. Door Edge Profile: Beveled on both edges.
 - 4. Door Texture: Smooth faces.
 - 5. Glazed Lights: Non-removable stops on non-secure side; sizes and configurations as indicated on drawings.
 - 6. Hardware Preparation: In accordance with BHMA A156.115, with reinforcement welded in place, in addition to other requirements specified in door grade standard.
 - 7. Galvanizing: All components hot-dipped zinc-iron alloy-coated (galvannealed), manufacturer's standard coating thickness.
 - 8. Finish: Factory primed, for field finishing.
- B. Combined Requirements: If a particular door and frame unit is indicated to comply with more than one type of requirement, comply with all the specified requirements for each type; for instance, an exterior door that is also indicated as being sound-rated must comply with the requirements specified for exterior doors and for sound-rated doors; where two requirements conflict, comply with the most stringent.

2.03 STEEL DOORS

- A. Exterior Doors:
 - 1. Grade: ANSI A250.8 Level 3, physical performance Level A, Model 2, seamless. 16 gage, Extra Heavy Duty.
 - 2. Core: Polystyrene foam.

EXHIBIT "A"

3. Top Closures for Outswinging Doors: Flush with top of faces and edges.
4. Galvanizing: All components hot-dipped zinc-iron alloy-coated (galvannealed) in accordance with ASTM A653/A653M, with manufacturer's standard coating thickness.
5. Texture: Smooth faces.
6. Embossed Panel Metal door with six panel configuration to be provided as indicated. Doors to be similar to Steelcraft CE20-Series EMCRAFT Doors, Model E6.
7. Insulating Value: U-value of 0.50, when tested in accordance with ASTM C1363.
8. Weatherstripping: Separate, see Section 08 71 00.

B. Interior Doors, Non-Fire-Rated:

1. Grade: ANSI A250.8 Level 3, physical performance Level A, Model 2, seamless: 16 gage, Extra Heavy Duty.
2. Core: Cardboard honeycomb.
3. Thickness: 1-3/4 inches.

2.04 STEEL FRAMES

A. General:

1. Comply with the requirements of grade specified for corresponding door.
 - a. ANSI A250.8 Level 3 Doors: 14 gage frames.
 - b. Frames for Wood Doors: Comply with frame requirements specified in ANSI A250.8 for Level 2
2. Finish: Factory primed, for field finishing.
3. Provide mortar guard boxes for hardware cut-outs in frames to be installed in masonry or to be grouted.
4. Frames in Masonry Walls: Size to suit masonry coursing with head member 4 inches high to fill opening without cutting masonry units.
5. Frames Wider than 48 Inches: Reinforce with steel channel fitted tightly into frame head, flush with top.
6. Frames Installed Back-to-Back: Reinforce with steel channels anchored to floor and overhead structure.
7. Frames to be installed in existing masonry or stud walls or openings may be knock-down or expandable type with exposed flush anchors.

B. Exterior Door Frames: Face welded, seamless with joints filled.

1. Galvanizing: All components hot-dipped zinc-iron alloy-coated (galvannealed) in accordance with ASTM A653/A653M, with manufacturer's standard coating thickness.
2. Finish: Factory primed, for field finishing.
3. Weatherstripping: Separate, see Section 08 71 00.

C. Interior Door Frames, Non-Fire-Rated: Face welded type.

D. Frames for Interior Glazing or Borrowed Lights: Construction and face dimensions to match door frames, and as indicated on drawings.

2.05 ACCESSORY MATERIALS

A. Louvers: Roll formed steel with overlapping frame; finish same as door components; factory-installed.

1. In Fire-Rated Doors: UL-listed fusible link louver, same rating as door.
2. Style: Stormproof with insect screen at exterior locations.
3. Louver Free Area: 50 percent.
4. Fasteners: Exposed or concealed fasteners.

B. Glazing: 1/4" clear tempered safety glass at interior and 1/2" laminated safety glass at exterior as indicated. High wind debris impact certification is not required.

C. Removable Stops: Formed sheet steel, shape as indicated on drawings, mitered or butted

EXHIBIT "A"

corners; prepared for countersink style tamper proof screws.

- D. Grout for Frames: Portland cement grout of maximum 4-inch slump for hand troweling; thinner pumpable grout is prohibited.
- E. Silencers: Resilient rubber, fitted into drilled hole; 3 on strike side of single door, 3 on center mullion of pairs, and 2 on head of pairs without center mullions.
- F. Temporary Frame Spreaders: Provide for all factory- or shop-assembled frames.

2.06 FINISH MATERIALS

- A. Primer: Rust-inhibiting, complying with ANSI A250.10, door manufacturer's standard.
- B. Bituminous Coating: Asphalt emulsion or other high-build, water-resistant, resilient coating.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Verify existing conditions before starting work.
- B. Verify that opening sizes and tolerances are acceptable.

3.02 PREPARATION

- A. Coat inside of frames to be installed in masonry or to be grouted, with bituminous coating, prior to installation.

3.03 INSTALLATION

- A. Install in accordance with the requirements of the specified door grade standard and NAAMM HMMA 840.
- B. In addition, install fire rated units in accordance with NFPA 80.
- C. Coordinate frame anchor placement with wall construction.
- D. Grout frames in masonry construction, using hand trowel methods; brace frames so that pressure of grout before setting will not deform frames.
- E. Coordinate installation of hardware.
- F. Coordinate installation of glazing.
- G. Coordinate installation of electrical connections to electrical hardware items.
- H. Touch up damaged factory finishes.

3.04 TOLERANCES

- A. Clearances Between Door and Frame: As specified in ANSI A250.8.
- B. Maximum Diagonal Distortion: 1/16 in measured with straight edge, corner to corner.

3.05 ADJUSTING

- A. Adjust for smooth and balanced door movement.

3.06 SCHEDULE

- A. Refer to Door and Frame Schedule on the drawings.

END OF SECTION

SECTION 08 14 16

FLUSH WOOD DOORS

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Flush wood doors; flush glazed configuration; non-rated.

1.02 REFERENCE STANDARDS

- A. AWI/AWMAC (QSI) - Architectural Woodwork Quality Standards Illustrated; Architectural Woodwork Institute and Architectural Woodwork Manufacturers Association of Canada; 2005, 8th Ed., Version 2.0.

1.03 SUBMITTALS

- A. See Section 01 30.00 - Administrative Requirements for submittal procedures.
- B. Product Data: Indicate door core materials and construction; veneer species, type and characteristics.
- C. Specimen warranty.
- D. Shop Drawings: Illustrate door opening criteria, elevations, sizes, types, swings, undercuts required, special beveling, special blocking for hardware, factory machining criteria, factory finishing criteria, identify cutouts for glazing.
- E. Samples: Submit two samples of door construction, 12x12 inch in size cut from top corner of door.
- F. Samples: Submit two samples of door veneer, 12x12 inch in size illustrating wood grain, stain color, and sheen.
- G. Manufacturer's Installation Instructions: Indicate special installation instructions.
- H. Warranty, executed in City of Fernandina Beach, Florida's name.

1.04 QUALITY ASSURANCE

- A. Maintain one copy of the specified door quality standard on site for review during installation and finishing.
- B. Manufacturer Qualifications: Company specializing in manufacturing the products specified in this section with minimum three years of documented experience.

1.05 DELIVERY, STORAGE, AND HANDLING

- A. Package, deliver and store doors in accordance with specified quality standard.
- B. Accept doors on site in manufacturer's packaging. Inspect for damage.
- C. Protect doors with resilient packaging sealed with heat shrunk plastic. Do not store in damp or wet areas; or in areas where sunlight might bleach veneer. Seal top and bottom edges with tinted sealer if stored more than one week. Break seal on site to permit ventilation.

1.06 PROJECT CONDITIONS

- A. Coordinate the work with door opening construction, door frame and door hardware installation.

1.07 WARRANTY

- A. See Section 01 78 00 - Closeout Submittals for additional warranty requirements.

EXHIBIT "A"

- B. Interior Doors: Provide manufacturer's warranty for the life of the installation.
- C. Provide warranty for the following term:
 - 1. Interior Doors: Life of installation.
- D. Include coverage for delamination of veneer, warping beyond specified installation tolerances, defective materials, and telegraphing core construction.

PART 2 PRODUCTS

2.01 MANUFACTURERS

- A. Wood Veneer Faced Doors:
 - 1. Graham Wood Doors: www.grahamdoors.com.
 - 2. Eggers Industries: www.eggersindustries.com.
 - 3. Haley Brothers: www.haleybros.com.
 - 4. Marshfield DoorSystems, Inc: www.marshfielddoors.com.
 - 5. Substitutions: See Section 01 60 00 - Product Requirements.

2.02 DOORS

- A. All Doors: See drawings for locations and additional requirements.
 - 1. Quality Level: Custom Grade, in accordance with AWI/AWMAC Architectural Woodwork Quality Standards Illustrated, Section 1300.
 - 2. Wood Veneer Faced Doors: 5-ply unless otherwise indicated.
- B. Interior Doors: 1-3/4 inches thick unless otherwise indicated; flush construction.
 - 1. Provide solid core doors at all locations.
 - 2. Wood veneer facing with factory transparent finish Riff cut Red Oak.

2.03 DOOR AND PANEL CORES

- A. Non-Rated Solid Core and 20 Minute Rated Doors: Type particleboard core (PC), plies and faces as indicated above.

2.04 DOOR FACINGS

- A. Wood Veneer Facing for Transparent Finish: Species as specified above, veneer grade as specified by quality standard, rotary cut, book veneer match, running assembly match; unless otherwise indicated.
 - 1. Vertical Edges: Compatible hardwood.
- B. Facing Adhesive: Type I - waterproof.

2.05 ACCESSORIES

- A. Metal Louvers:
 - 1. Material and Finish: Roll formed steel; pre-painted finish to scheduled color.
 - 2. Louver Blade: Inverted V blade, sight proof.
 - 3. Louver Free Area: 50 percent.
 - 4. Frame: Rolled steel channel shape, Mitered corners style with surface fasteners.
- B. Glazing Stops: Pre-painted finish to scheduled color, Rolled steel channel shape, mitered corners; prepared for countersink style tamper proof screws.
- C. Glazing: Provide laminated 1/4 clear safety laminated or tempered glass at all wood door locations indicated on drawings.

2.06 DOOR CONSTRUCTION

- A. Fabricate doors in accordance with door quality standard specified.

EXHIBIT "A"

- B. Cores Constructed with stiles and rails:
- C. Provide solid blocks at lock edge for hardware reinforcement.
 - 1. Provide solid blocking for other throughbolted hardware.
- D. Fit door edge trim to edge of stiles after applying veneer facing.
- E. Fit door edge trim to edge of stiles after applying veneer facing.
- F. Factory machine doors for hardware other than surface-mounted hardware, in accordance with hardware requirements and dimensions.
- G. Factory fit doors for frame opening dimensions identified on shop drawings, with edge clearances in accordance with specified quality standard.
 - 1. Exception: Doors to be field finished.
- H. Provide edge clearances in accordance with the quality standard specified.
- I. Provide edge clearances in accordance with AWI Quality Standards Illustrated Section 1700.

2.07 FACTORY FINISHING - WOOD VENEER DOORS

- A. Factory finish doors in accordance with specified quality standard:
 - 1. Transparent Finish: Transparent catalyzed polyurethane, Premium quality, satin sheen.
- B. Factory finish doors in accordance with approved sample.
- C. Seal door top edge with color sealer to match door facing.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Verify existing conditions before starting work.
- B. Verify that opening sizes and tolerances are acceptable.
- C. Do not install doors in frame openings that are not plumb or are out-of-tolerance for size or alignment.

3.02 INSTALLATION

- A. Install doors in accordance with manufacturer's instructions and specified quality standard.
- B. Factory-Finished Doors: Do not field cut or trim; if fit or clearance is not correct, replace door.
- C. Trim door height by cutting bottom edges to a maximum of 3/4 inch (19 mm).
- D. Use machine tools to cut or drill for hardware.
- E. Coordinate installation of doors with installation of frames and hardware.
- F. Coordinate installation of glazing.

3.03 TOLERANCES

- A. Conform to specified quality standard for fit and clearance tolerances.
- B. Conform to specified quality standard for telegraphing, warp, and squareness.
- C. Maximum Diagonal Distortion (Warp): 1/8 inch measured with straight edge or taut string, corner to corner, over an imaginary 36 by 84 inches surface area.
- D. Maximum Vertical Distortion (Bow): 1/8 inch measured with straight edge or taut string, top to bottom, over an imaginary 36 by 84 inches surface area.

EXHIBIT "A"

- E. Maximum Width Distortion (Cup): 1/8 inch measured with straight edge or taut string, edge to edge, over an imaginary 36 by 84 inches surface area.

3.04 ADJUSTING

- A. Adjust doors for smooth and balanced door movement.
- B. Adjust closers for full closure.

3.05 SCHEDULE - See Drawings

END OF SECTION

SECTION 08 14 33

STILE AND RAIL WOOD DOORS

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Wood doors, stile and rail design.
- B. Panels of glass.

1.02 REFERENCE STANDARDS

- A. AWI/AWMAC/MI (AWS) - Architectural Woodwork Standards; 2009.

1.03 SUBMITTALS

- A. See Section 01 30 00 - Administrative Requirements for submittal procedures.
- B. Product Data: Indicate stile and rail core materials and construction; veneer species, type and characteristics.
- C. Specimen warranty.
- D. Shop Drawings: Illustrate door opening criteria, elevations, sizes, types, swings, undercuts required, special beveling, special blocking for hardware, factory machining criteria, factory finishing criteria, identify cutouts for glazing, louvers, and _____.
- E. Samples: Submit two samples of door veneer, 6x6 inch in size illustrating wood grain, stain color, and sheen.
- F. Warranty, executed in City of Fernandina Beach, Florida's name.

1.04 QUALITY ASSURANCE

- A. Manufacturer Qualifications: Company specializing in manufacturing the Products specified in this section with minimum three years of documented experience.
 - 1. Company with at least one project in the past 5 years with value of woodwork within 20 percent of cost of woodwork for this Project.

1.05 DELIVERY, STORAGE, AND HANDLING

- A. Protect doors with resilient packaging sealed with heat shrunk plastic. Do not store in damp or wet areas; or in areas where sunlight might bleach veneer. Seal top and bottom edges with tinted sealer if stored more than one week. Break seal on site to permit ventilation.

1.06 WARRANTY

- A. See Section 01 78 00 - Closeout Submittals for additional warranty requirements.
- B. Include coverage for delamination of veneer, warping beyond specified installation tolerances, defective materials, telegraphing core construction,, and glazing.

PART 2 PRODUCTS

2.01 MANUFACTURERS

- A. Stile and Rail Wood Doors:
 - 1. Eggers Industries: www.eggersindustries.com.
 - 2. Mairman Company: www.mairman.com.
 - 3. Marshfield DoorSystems, Inc; : www.marshfielddoors.com.
 - 4. Substitutions: See Section 01 60 00 - Product Requirements.

2.02 DOORS

- A. Quality Level: Premium Grade, in accordance with AWI/AWMAC/MI Architectural Woodwork Standards.
- B. Interior Doors: 1-3/4 inches thick unless otherwise indicated; solid lumber construction; mortised and tenoned joints.

2.03 ACCESSORIES

- A. Molding: Wood, of same species as door facing, flat shape, mitered corners; prepared for countersink style tamper proof screws.

2.04 DOOR CONSTRUCTION

- A. Vertical Exposed Edge of Stiles: Of same species as veneer facing.
- B. Fit door edge trim to edge of stiles after applying veneer facing.
- C. Bond edge banding to cores.
- D. Factory machine doors for finish hardware in accordance with hardware requirements and dimensions. Do not machine for surface hardware.
- E. Factory fit doors for frame opening dimensions identified on shop drawings.

2.05 FACTORY FINISHING

- A. Finish work in accordance with AWI/AWMAC/MI Architectural Woodwork Standards, Section 5 - Finishing for Grade specified and as follows:
 - 1. Transparent:
 - a. System - 1, Lacquer, Nitrocellulose.
 - b. Stain: As selected by Architect.
 - c. Sheen: Satin.
- B. Factory finish doors in accordance with approved sample.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Verify existing conditions before starting work.
- B. Verify that opening sizes and tolerances are acceptable.
- C. Do not install doors in frame openings that are not plumb or are out of tolerance for size or alignment.

3.02 INSTALLATION

- A. Install doors in accordance with manufacturer's instructions and AWI/AWMAC Quality Standards requirements.
- B. Trim door width by cutting equally on both jamb edges.
- C. Trim door height by cutting bottom edges to a maximum of 3/4 inch.
- D. Machine cut for hardware.
- E. Coordinate installation of doors with installation of frames and hardware.
- F. Coordinate installation of glazing.

3.03 TOLERANCES

EXHIBIT "A"

- A. Conform to specified quality standard for fit, clearance, and joinery tolerances.
- B. Maximum Width Distortion (Cup): 1/8 inch measured with straight edge or taut string, edge to edge, over an imaginary 36 x 84 inch surface area.

3.04 ADJUSTING

- A. Adjust doors for smooth and balanced door movement.
- B. Adjust closers for full closure.

3.05 SCHEDULE - See Drawings

END OF SECTION

SECTION 08 43 13

ALUMINUM-FRAMED STOREFRONTS

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Aluminum-framed storefront, with vision glass.
- B. Infill panels of glass.
- C. Aluminum doors and frames.
- D. Weatherstripping.
- E. Incorporation of electrical operator system on exterior pair of doors.
- F. Door hardware.
- G. Perimeter sealant.

1.02 REFERENCE STANDARDS

- A. AAMA CW-10 - Care and Handling of Architectural Aluminum From Shop to Site; American Architectural Manufacturers Association; 2012.
- B. AAMA 611 - Voluntary Specification for Anodized Architectural Aluminum; American Architectural Manufacturers Association; 2012.
- C. ASTM B209 - Standard Specification for Aluminum and Aluminum-Alloy Sheet and Plate; 2010.
- D. ASTM B209M - Standard Specification for Aluminum and Aluminum-Alloy Sheet and Plate [Metric]; 2010.
- E. ASTM B221 - Standard Specification for Aluminum and Aluminum-Alloy Extruded Bars, Rods, Wire, Profiles, and Tubes; 2012.
- F. ASTM B221M - Standard Specification for Aluminum and Aluminum-Alloy Extruded Bars, Rods, Wire, Profiles, and Tubes [Metric]; 2012.
- G. 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 (Reapproved 2012).
- H. ASTM E330 - Standard Test Method for Structural Performance of Exterior Windows, Doors, Skylights and Curtain Walls by Uniform Static Air Pressure Difference; 2002 (Reapproved 2010).

1.03 ADMINISTRATIVE REQUIREMENTS

- A. Coordinate with installation of other components that comprise the exterior enclosure.
- B. Preinstallation Meeting: Conduct a preinstallation meeting one week before starting work of this section; require attendance by all affected installers.

1.04 SUBMITTALS

- A. See Section 01 30 00 - Administrative Requirements, for submittal procedures.
- B. Product Data: Provide component dimensions, describe components within assembly, anchorage and fasteners, glass and infill, door hardware, internal drainage details.
- C. Shop Drawings: Indicate system dimensions, framed opening requirements and tolerances, affected related Work, expansion and contraction joint location and details, and field welding

EXHIBIT "A"

required.

- D. Design Data: Provide framing member structural and physical characteristics, engineering calculations, dimensional limitations.
- E. Hardware Schedule: Complete itemization of each item of hardware to be provided for each door, cross-referenced to door identification numbers in Contract Documents.
- F. Samples: Submit two samples 6 x 6 inches in size illustrating finished aluminum surface, glass, glazing materials.
- G. Manufacturer's Certificate: Certify that the products supplied meet or exceed the specified requirements.
- H. Warranty: Submit manufacturer warranty and ensure forms have been completed in City of Fernandina Beach, Florida's name and registered with manufacturer.

1.05 DELIVERY, STORAGE, AND HANDLING

- A. Handle products of this section in accordance with AAMA CW-10.
- B. Protect finished aluminum surfaces with wrapping. Do not use adhesive papers or sprayed coatings that bond to aluminum when exposed to sunlight or weather.

1.06 FIELD CONDITIONS

- A. Do not install sealants when ambient temperature is less than 40 degrees F. Maintain this minimum temperature during and 48 hours after installation.

1.07 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. 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:
 - 1. YKK; Product YKK AP Series YHS 50 FI Hurricane Impact Resistant Storefront Laminated Glazing System with 08410 35H Impact resistant Heavy Duty Swing Doors.
- B. Other Acceptable Manufacturers:
 - 1. Kawneer North America: www.kawneer.com.
 - 2. United States Aluminum Corp: www.usalum.com.
 - 3. Oldcastle BuildingEnvelope: www.oldcastlebe.com.
 - 4. Substitutions: See Section 01 60 00 - Product Requirements.

2.02 STOREFRONT

- A. Aluminum-Framed Storefront: Factory fabricated, factory finished aluminum framing members with infill, and related flashings, anchorage and attachment devices.
 - 1. Glazing Position: Centered (front to back).
 - 2. Design Wind Load: 70 lbf/sq ft, positive and negative.
 - 3. Finish: Class I color anodized.
 - 4. Color: As selected from manufacturer's standards.

EXHIBIT "A"

B. Performance Requirements:

1. Design and size components to withstand the specified load requirements without damage or permanent set, when tested in accordance with ASTM E330, using loads 1.5 times the design wind loads and 10 second duration of maximum load.
 - a. Member Deflection: Limit member deflection to flexure limit of glass in any direction, with full recovery of glazing materials.
2. Movement: Accommodate movement between storefront and perimeter framing and deflection of lintel, without damage to components or deterioration of seals.
3. Air Infiltration: Limit air infiltration through assembly to 0.06 cu ft/min/sq ft of wall area, measured at specified differential pressure across assembly in accordance with ASTM E283.
4. System Internal Drainage: Drain to the exterior by means of a weep drainage network any water entering joints, condensation occurring in glazing channel, and migrating moisture occurring within system.
5. Expansion/Contraction: Provide for expansion and contraction within system components caused by cycling temperature range of 170 degrees F over a 12 hour period without causing detrimental effect to system components, anchorages, and other building elements.

2.03 COMPONENTS

- A. Aluminum Framing Members: Tubular aluminum sections, thermally broken with interior section insulated from exterior, drainage holes and internal weep drainage system.
 1. Framing members for interior applications need not be thermally broken.
 2. Glazing stops:
 3. Cross-Section: As indicated on drawings.
 4. Structurally Reinforced Members: Extruded aluminum with internal reinforcement of structural steel member.
- B. Doors: Glazed aluminum.
 1. Thickness: 1-3/4 inches.
 2. Top Rail: 4 inches wide.
 3. Vertical Stiles: 4-1/2 inches wide.
 4. Mid Rail: 6 inches wide.
 5. Bottom Rail: 6 inches wide.
 6. Glazing Stops: Square.
 7. Finish: Same as storefront.
 8. Basis of Design: YKK AP America Inc; Model 35H.

2.04 MATERIALS

- A. Extruded Aluminum: ASTM B221 (ASTM B221M).
- B. Sheet Aluminum: ASTM B209 (ASTM B209M).
- C. Fasteners: Stainless steel.
- D. Exposed Flashings: 0.032 inch thick aluminum sheet; finish to match framing members.
- E. Concealed Flashings: 0.018 inch thick galvanized steel.
- F. Perimeter Sealant: Type specified in Section 07 90 05.
- G. Glass: As specified in Section 08 80 00.
 1. Glass in Exterior Framing: Type Laminated Impact Resistant.
 2. Glass in Interior Framing: Type Tempered.
 3. Glass in Doors: Type Laminated Impact Resistant.
- H. Glazing Gaskets: Type to suit application to achieve weather, moisture, and air infiltration requirements.

EXHIBIT "A"

2.05 FINISHES

- A. At new interior aluminum storefront and door in Additive Alternate 1: Class I Natural Anodized Finish: AAMA 611 AA-M12C22A41 Clear anodic coating or AAMA 612 clear anodic coating with electrolytically deposited organic seal; not less than 0.7 mils thick.
- B. At new exterior aluminum storefront and entrance doors: Class I Color Anodized Finish: AAMA 611 AA-M12C22A42 Integrally colored anodic coating or AAMA 612 electrolytically deposited colored anodic coating with electrolytically deposited organic seal; not less than 0.7 mils thick.
- C. Color Pattern of exterior Framing systems will require two colors. One for perimeter frame, and one for field vertical and horizontal mulls.

2.06 HARDWARE

- A. Door Hardware: Storefront manufacturer's standard type to suit application.
- B. Weatherstripping: Wool pile, continuous and replaceable; provide on all doors.
- C. Sill Sweep Strips: Resilient seal type, retracting, of neoprene; provide on all exterior doors.
- D. Threshold: Extruded aluminum, one piece per door opening, ribbed surface; provide on all doors.
- E. Pivots: Center type; top and bottom.
 - 1. Provide on all doors.
- F. Pull Set:
 - 1. Provide on exterior doors.
- G. Push/Pull Set:
 - 1. Provide on Interior doors.
- H. Exit Devices: As specified in Section 08 71 09.
 - 1. Provide on exterior doors.
- I. Closers:
 - 1. Provide on all doors.
- J. Locks: Dead latch with thumbturn inside; keyed cylinder outside.
 - 1. Provide on all doors.
- K. Automatic Door Operators and Actuators: As specified in Section 08 42 29.

2.07 FABRICATION

- A. Fabricate components with minimum clearances and shim spacing around perimeter of assembly, yet enabling 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. Fabricate anchors.
- D. Coat concealed metal surfaces that will be in contact with cementitious materials or dissimilar metals with bituminous paint.
- E. Arrange fasteners and attachments to conceal from view.
- F. Reinforce components internally for door hardware and door operators.
- G. Reinforce framing members for imposed loads.
- H. Finishing: Apply factory finish to all surfaces that will be exposed in completed assemblies.
 - 1. Touch-up surfaces cut during fabrication so that no natural aluminum is visible in completed assemblies, including joint edges.

PART 3 EXECUTION**3.01 EXAMINATION**

- A. Verify dimensions, tolerances, and method of attachment with other work.
- B. Verify that wall openings and adjoining air and vapor seal materials are ready to receive work of this section.

3.02 INSTALLATION

- A. Install wall system in accordance with manufacturer's instructions.
- B. Attach to structure to permit sufficient adjustment to accommodate construction tolerances and other irregularities.
- C. Provide alignment attachments and shims to permanently fasten system to building structure.
- D. Align assembly plumb and level, free of warp or twist. Maintain assembly dimensional tolerances, aligning with adjacent work.
- E. Provide thermal isolation where components penetrate or disrupt building insulation.
- F. Install sill flashings. Turn up ends and edges; seal to adjacent work to form water tight dam.
- G. Where fasteners penetrate sill flashings, make watertight by seating and sealing fastener heads to sill flashing.
- H. Coordinate attachment and seal of perimeter air and vapor barrier materials.
- I. Pack fibrous insulation in shim spaces at perimeter of assembly to maintain continuity of thermal barrier.
- J. Set thresholds in bed of mastic and secure.
- K. Install hardware using templates provided.
 - 1. See Section 08 42 29 for operator and actuator installation requirements.
- L. Install glass and infill panels in accordance with Section 08 80 00, using glazing method required to achieve performance criteria.
- M. Install perimeter sealant in accordance with Section 07 90 05.
- N. Touch-up minor damage to factory applied finish; replace components that cannot be satisfactorily repaired.

3.03 TOLERANCES

- A. Maximum Variation from Plumb: 0.06 inches every 3 ft non-cumulative or 1/16 inches per 10 ft, whichever is less.
- B. Maximum Misalignment of Two Adjoining Members Abutting in Plane: 1/32 inch.

3.04 ADJUSTING

- A. Adjust operating hardware and sash for smooth operation.

3.05 CLEANING

- A. Remove protective material from pre-finished aluminum surfaces.
- B. Wash down surfaces with a solution of mild detergent in warm water, applied with soft, clean wiping cloths. Take care to remove dirt from corners. Wipe surfaces clean.
- C. Remove excess sealant by method acceptable to sealant manufacturer.

SECTION 09 68 00

CARPETING

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Carpet, direct-glued.
- B. Removal of existing carpet.
- C. Accessories.

1.02 REFERENCE STANDARDS

- A. ASTM D2859 - Standard Test Method for Ignition Characteristics of Finished Textile Floor Covering Materials; 2006 (Reapproved 2011).
- B. ASTM E648 - Standard Test Method for Critical Radiant Flux of Floor Covering Systems Using a Radiant Heat Energy Source; 2010e1.
- C. CRI (CIS) - Carpet Installation Standard; Carpet and Rug Institute; 2009.
- D. NFPA 253 - Standard Method of Test for Critical Radiant Flux of Floor Covering Systems Using a Radiant Heat Energy Source; National Fire Protection Association; 2011.

1.03 SUBMITTALS

- A. See Section 01 30 00 - Administrative Requirements, for submittal procedures.
- B. Shop Drawings: Indicate seaming plan, method of joining seams, direction of carpet pile and pattern, location of edge moldings and edge bindings.
- C. Product Data: Provide data on specified products, describing physical and performance characteristics; sizes, patterns, colors available, and method of installation.
- D. Samples: Submit two samples 12 x 12 inch in size illustrating color and pattern for each carpet material specified.
- E. Submit two, 6 inch long samples of edge strip for each color specified.
- F. Manufacturer's Installation Instructions: Indicate special procedures.
- G. Maintenance Data: Include maintenance procedures, recommended maintenance materials, and suggested schedule for cleaning.

1.04 FIELD CONDITIONS

- A. Store materials in area of installation for minimum period of 24 hours prior to installation.
- B. Maintain minimum 70 degrees F ambient temperature 24 hours prior to, during and 24 hours after installation.
- C. Ventilate installation area during installation and for 72 hours after installation.

1.05 EXTRA MATERIALS

- A. See Section 01 60 00 - Product Requirements, for additional requirements.
- B. Provide 100 sq ft of carpeting of each type, color, and pattern specified, and all scraps larger than 12 x 24 inches in size.

PART 2 PRODUCTS

EXHIBIT "A"

- D. Cant Strips: Molded of flooring resin material.
- E. Subfloor Filler: White premix latex; type recommended by flooring material manufacturer.
- F. Primers and Adhesives: Waterproof; types recommended by flooring manufacturer.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Apply manufacturers filler and verify that sub-floor surfaces are smooth and flat within the tolerances specified for that type of work and are ready to receive flooring.
- B. Apply manufacturers filler and verify that wall surfaces are smooth and flat within the tolerances specified for that type of work, are dust-free, and are ready to receive flooring.
- C. Verify that concrete sub-floor surfaces are ready for flooring installation by testing for moisture emission rate and alkalinity; obtain instructions if test results are not within limits recommended by flooring materials manufacturer.
- D. Verify that required floor-mounted utilities are in correct location.

3.02 PREPARATION

- A. Remove sub-floor ridges and bumps. Fill low spots, cracks, joints, holes, and other defects with sub-floor filler.
- B. Apply, trowel, and float filler to achieve smooth, flat, hard surface. Grind irregularities above the surface level. Prohibit traffic until filler is cured.
- C. Vacuum clean substrate.
- D. Apply primer to surfaces required by flooring manufacturer.

3.03 INSTALLATION - STRIPS

- A. Accurately saw cut substrate to install divider strips.
- B. Install strips straight and level to locations indicated.
- C. Install cant strips at base of walls where flooring is to be extended up wall as base.
- D. Install base divider strips to match floor pattern. Install terminating cap strip at top of base; attach securely to wall substrate.

3.04 INSTALLATION - FLOORING AND BASE

- A. Apply in accordance with manufacturer's instructions.
- B. Apply each coat to minimum thickness indicated.
- C. Finish to smooth level surface.
- D. Cove at vertical surfaces.

3.05 PROTECTION

- A. Prohibit traffic on floor finish for 48 hours after installation.
- B. Barricade area to protect flooring until cured.

END OF SECTION

EXHIBIT "A"

- C. Maintain ambient temperature required by manufacturer 72 hours prior to, during, and 24 hours after installation of materials.

1.07 EXTRA MATERIALS

- A. Provide 2 gal of flooring material, of each color selected.

PART 2 PRODUCTS

2.01 MANUFACTURERS

- A. Fluid-Applied Flooring:
1. Design Basis: Plexi-Chemie, Inc., Jacksonville, Florida, (Tel 904-693-8800) Product: PlexiQuartz CRI Epoxy System. See Material and Color Schedule for EC-1 and EC-2 requirements.
 2. Dur-A-Flex Inc.: www.dur-a-flex.com.
 3. General Polymers: www.generalpolymers.com.
 4. BASF Construction Chemicals-Building Systems: www.buildingsystems.basf.com.

2.02 MATERIALS

- A. Fluid-Applied Flooring Type EC-1 and EC-1: Epoxy, single component, thermosetting.
1. Product: PlexiQuartz CRI manufactured by Plexi-Chemie, Inc..
 2. Base Coat: 1/8 inch thick; Clear color.
 3. Top Coat: Epoxy, single component, thermosetting; minimum 3/16 inch thick; Clear color.
 4. Non-slip Surfacing: Mineral, Selected colors.
 5. Roll-Coat installed floor with 3-5 MILS of Polyaspartic Urethane PlexiCrest XP by Plexi-Chemie, Inc.
 6. Critical Radiant Flux: Minimum of 0.22 watts/sq cm, when tested in accordance with ASTM E648.
 7. Tensile Strength: 6,000 psi, when tested in accordance with ASTM D638.
 8. Compressive Strength: 17,500 psi, when tested in accordance with ASTM D695.
 9. Water Absorption: 0.02 percent, when tested in accordance with ASTM D570 for 24 hr.
 10. Adhesion in Shear Strength: 450 psi minimum, when tested in accordance with ASTM D905.
 11. Abrasion Resistance: Maximum weight loss of less than .003 g/1000 cycles, when tested in accordance with ASTM D4060.
 12. Impact Resistance: 1/6 in/lb; no cracking, chipping or delamination, when tested with Gardner Impact Tester.
 13. Mildew Resistance: No growth.
 14. Color: Selected by Architect.
- B. Waterproof membrane underlayment over prepared existing concrete floor. Flexible elastimeric 60 mil thick urethane membrane system PlexiSure 170 by Plexi-Chemie, Inc. with Primer/Sealer, Chopped fireglass at joints and corners. Extend membrane over all floors to receive Epoxy Flooring and extend up walls for base.
- C. Epoxy Floor Fill to accommodate voids and sloped finish to match existing floor levels. Epoxy PlexiClad DeepFill by Plexi-Chemie, Inc. with PlexiGlaze #4 Prime Coat.

2.03 ACCESSORIES

- A. Divider Strips: Zinc, 1/4 inch thick, height to match flooring thickness, with anchoring features; color as selected.
- B. Control Joint Strips: Match divider strips; 1/4 inch nominal width, 1/8 inch wide neoprene filler strip between side strips, with anchoring features, strip height to suit flooring thickness.
- C. Base Caps, and Separator Strips: Match divider strips, with projecting base of 1/8 inch.

SECTION 09 67 00

FLUID-APPLIED FLOORING

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Fluid-applied epoxy resin/quartz granule flooring and base.
- B. Waterproof membrane underlayment over existing prepared concrete floor.
- C. Divider strips and accessories.

1.02 REFERENCE STANDARDS

- A. ASTM D570 - Standard Test Method for Water Absorption of Plastics; 1998 (Reapproved 2010).
- B. ASTM D638 - Standard Test Method for Tensile Properties of Plastics; 2010.
- C. ASTM D 695 - Standard Test Method for Compressive Properties of Rigid Plastics; 2008.
- D. ASTM D905 - Standard Test Method for Strength Properties of Adhesive Bonds in Shear by Compression Loading; 2008.
- E. ASTM D4060 - Standard Test Method for Abrasion Resistance of Organic Coatings by the Taber Abraser; 2010.
- F. ASTM E648 - Standard Test Method for Critical Radiant Flux of Floor-Covering Systems Using a Radiant Heat Energy Source; 2010e1.

1.03 SUBMITTALS

- A. Product Data: Provide data on specified products, describing physical and performance characteristics; sizes, patterns and colors available.
- B. Samples: Submit two samples, 12x12 inch in size illustrating color and pattern for each floor material for each color specified.
- C. Manufacturer's Installation Instructions: Indicate special procedures.
- D. Maintenance Data: Include maintenance procedures, recommended maintenance materials, procedures for stain removal, repairing surface, and suggested schedule for cleaning.

1.04 QUALITY ASSURANCE

- A. Manufacturer Qualifications: Company specializing in manufacturing products specified in this section with minimum three years documented experience.
- B. Applicator Qualifications: Company specializing in performing work of this section with minimum 5 years experience.

1.05 DELIVERY, STORAGE, AND HANDLING

- A. Store resin materials in a dry, secure area.
- B. Store materials for three days prior to installation in area of installation to achieve temperature stability.

1.06 FIELD CONDITIONS

- A. Maintain minimum temperature in storage area of 55 degrees F.
- B. Store materials in area of installation for minimum period of 24 hours prior to installation.

- H. Scribe flooring to walls, columns, cabinets, floor outlets, and other appurtenances to produce tight joints.
- I. Install flooring in recessed floor access covers, maintaining floor pattern.

3.04 TILE FLOORING

- A. Install in accordance with manufacturer's instructions.
- B. Mix tile from container to ensure shade variations are consistent when tile is placed, unless manufacturer's instructions say otherwise.
- C. Spread only enough adhesive to permit installation of materials before initial set.
- D. Set flooring in place, press with heavy roller to attain full adhesion.
- E. Lay flooring with joints and seams parallel to building lines to produce symmetrical tile pattern.
- F. Install tile to basket weave pattern. Allow minimum 1/2 full size tile width at room or area perimeter.
- G. Where floor finishes are different on opposite sides of door, terminate flooring under centerline of door.
- H. Install edge strips at unprotected or exposed edges, where flooring terminates, and where indicated.
- I. Scribe flooring to walls, columns, cabinets, floor outlets, and other appurtenances to produce tight joints.
- J. Install flooring in recessed floor access covers. Maintain floor pattern.
- K. Install feature strips and floor markings where indicated. Fit joints tightly.

3.05 RESILIENT BASE

- A. Fit joints tightly and make vertical. Maintain minimum dimension of 18 inches between joints.
- B. Miter internal corners. At external corners, use premolded units. At exposed ends, use premolded units.
- C. Install base on solid backing. Bond tightly to wall and floor surfaces.
- D. Scribe and fit to door frames and other interruptions.

3.06 CLEANING

- A. Remove excess adhesive from floor, base, and wall surfaces without damage.
- B. Clean in accordance with manufacturer's instructions.
- C. Clean, seal, and wax resilient flooring products in accordance with manufacturer's instructions and are compatible with current Nassau County School Board maintenance practices.

3.07 PROTECTION

- A. Prohibit traffic on resilient flooring for 48 hours after installation.

END OF SECTION

EXHIBIT "A"

- D. Filler for Coved Base: Plastic.
- E. Sealer and Wax: Types recommended by flooring manufacturer.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Verify that surfaces are flat to tolerances acceptable to flooring manufacturer, free of cracks that might telegraph through flooring, clean, dry, and free of curing compounds, surface hardeners, and other chemicals that might interfere with bonding of flooring to substrate.
- B. Verify that sub-floor surfaces are smooth and flat within the tolerances specified for that type of work and are ready to receive resilient flooring.
- C. Verify that wall surfaces are smooth and flat within the tolerances specified for that type of work, are dust-free, and are ready to receive resilient base.
- D. Verify that sub-floor surfaces are dust-free and free of substances which would impair bonding of adhesive materials to sub-floor surfaces.
- E. Verify that concrete sub-floor surfaces are ready for resilient flooring installation by testing for moisture emission rate and alkalinity; obtain instructions if test results are not within the following limits:
 - 1. Moisture emission rate: Not greater than 5 lb per 1000 sq ft per 24 hours when tested using calcium chloride moisture test kit for 72 hours.
 - 2. Alkalinity: pH range of 5-9.
- F. Verify that required floor-mounted utilities are in correct location.

3.02 PREPARATION

- A. Remove existing resilient flooring and flooring adhesives; follow the recommendations of RFCI Recommended Work Practices for Removal of Resilient Floor Coverings.
- B. Prepare floor substrates as recommended by flooring and adhesive manufacturers.
- C. Remove sub-floor ridges and bumps. Fill minor low spots, cracks, joints, holes, and other defects with sub-floor filler to achieve smooth, flat, hard surface.
- D. Prohibit traffic until filler is cured.
- E. Clean substrate.
- F. Apply primer as required to prevent "bleed-through" or interference with adhesion by substances that cannot be removed.

3.03 INSTALLATION

- A. Starting installation constitutes acceptance of sub-floor conditions.
- B. Install in accordance with manufacturer's instructions.
- C. Spread only enough adhesive to permit installation of materials before initial set.
- D. Fit joints tightly.
- E. Set flooring in place, press with heavy roller to attain full adhesion.
- F. Where type of floor finish, pattern, or color are different on opposite sides of door, terminate flooring under centerline of door.
- G. Install edge strips at unprotected or exposed edges, where flooring terminates, and where indicated.

1.05 EXTRA MATERIALS

- A. See Section 01 60 00 - Product Requirements, for additional provisions.
- B. Provide 100 sq ft of flooring, 50 lineal feet of base, of each type and color specified.

PART 2 PRODUCTS**2.01 TILE FLOORING**

- A. Vinyl Composition Tile: Homogeneous, with color extending throughout thickness, and: See Interior Material Legend on Drawing A-605 for Design Basis Type VCT-1.
 - 1. Minimum Requirements: Comply with ASTM F1066, of Class corresponding to type specified.
 - 2. Critical Radiant Flux (CRF): Minimum 0.45 watt per square centimeter, when tested in accordance with ASTM E 648 or NFPA 253.
 - 3. Size: 12 x 12 inch.
 - 4. VOC Content: Certified as Low Emission by one of the following :
 - a. GreenGuard Children and Schools; www.greenguard.org.
 - b. SCS Floorscore; www.scs-certified.com.
 - c. Product listing in the CHPS Low-Emitting Materials Product List at; www.chps.net/manual/lem_table.htm.
 - 5. Thickness: 0.125 inch.
 - 6. Pattern: Marbleized.
 - 7. Manufacturers:
 - a. Armstrong World Industries, Inc. www.armstrong.com.
 - b. Mannington Mills, Inc: www.mannington.com.
 - c. Tarkett Inc: www.tarkett.com.
 - d. Substitutions: See Section 01 60 00 - Product Requirements.
- B. Feature Strips: Of same material as tile, 2 inch wide.

2.02 RESILIENT BASE

- A. Resilient Base: ASTM F1861, Type TS rubber, vulcanized thermoset; top set Style B, Cove, and as follows: See Material and Color Schedule for Design Basis.
 - 1. Critical Radiant Flux (CRF): Minimum 0.45 watt per square centimeter, when tested in accordance with ASTM E 648 or NFPA 253.
 - 2. Height: 4 inch.
 - 3. Thickness: 0.125 inch thick.
 - 4. Finish: Satin.
 - 5. Length: Roll.
 - 6. Color: Color as selected from manufacturer's standards.
 - 7. Accessories: Premolded external corners and end stops.
 - 8. Manufacturers:
 - a. Burke Flooring: www.burkemercer.com.
 - b. Johnsonite, Inc; Product : www.johnsonite.com.
 - c. Roppe Corp: www.roppe.com.
 - d. Substitutions: See Section 01 60 00 - Product Requirements.

2.03 ACCESSORIES

- A. Subfloor Filler: White premix latex; type recommended by adhesive material manufacturer.
- B. Primers, Adhesives, and Seaming Materials: Waterproof; types recommended by flooring manufacturer.
- C. Moldings, Transition and Edge Strips: Same material as flooring.

EXHIBIT "A"

required.

- G. Hang suspension system independent of walls, columns, ducts, pipes and conduit. Where carrying members are spliced, avoid visible displacement of face plane of adjacent members.
- H. Where ducts or other equipment prevent the regular spacing of hangers, reinforce the nearest affected hangers and related carrying channels to span the extra distance.
- I. Do not support components on main runners or cross runners if weight causes total dead load to exceed deflection capability.
- J. Support fixture loads using supplementary hangers located within 6 inches of each corner, or support components independently.
- K. Do not eccentrically load system or induce rotation of runners.
- L. Perimeter Molding: Install at intersection of ceiling and vertical surfaces and at junctions with other interruptions.
 - 1. Install in bed of acoustical sealant.
 - 2. Use longest practical lengths.
 - 3. Overlap and rivet corners.

3.03 INSTALLATION - ACOUSTICAL UNITS

- A. Install acoustical units in accordance with manufacturer's instructions.
- B. Fit acoustical units in place, free from damaged edges or other defects detrimental to appearance and function.
- C. Fit border trim neatly against abutting surfaces.
- D. Install units after above-ceiling work is complete.
- E. Install acoustical units level, in uniform plane, and free from twist, warp, and dents.
- F. Cutting Acoustical Units:
 - 1. Make field cut edges of same profile as factory edges.
 - 2. Double cut and field paint exposed reveal edges.
- G. Where round obstructions occur, provide preformed closures to match perimeter molding.
- H. Lay acoustical insulation for a distance of 48 inches either side of acoustical partitions as indicated.
- I. Lay acoustical insulation over toilet ceilings as indicated.
- J. Install hold-down clips on panels within 20 ft of an exterior door.

3.04 TOLERANCES

- A. Maximum Variation from Flat and Level Surface: 1/8 inch in 10 feet.
- B. Maximum Variation from Plumb of Grid Members Caused by Eccentric Loads: 2 degrees.

END OF SECTION

1.05 QUALITY ASSURANCE

- A. Suspension System Manufacturer Qualifications: Company specializing in manufacturing the products specified in this section with minimum three years documented experience.
- B. Acoustical Unit Manufacturer Qualifications: Company specializing in manufacturing the products specified in this section with minimum three years documented experience.

1.06 FIELD CONDITIONS

- A. Maintain uniform temperature of minimum 60 degrees F, and maximum humidity of 40 percent prior to, during, and after acoustical unit installation.

1.07 PROJECT CONDITIONS

- A. Sequence work to ensure acoustical ceilings are not installed until building is enclosed, sufficient heat is provided, dust generating activities have terminated, and overhead work is completed, tested, and approved.
- B. Install acoustical units after interior wet work is dry.

1.08 EXTRA MATERIALS

- A. See Section 01 60 00 - Product Requirements, for additional provisions.
- B. Provide 100 sq ft of each type of acoustical unit for City of Fernandina Beach, Florida's use in maintenance of project.

PART 2 PRODUCTS**2.01 ACOUSTICAL UNITS**

- A. Manufacturers:
 - 1. Armstrong World Industries, Inc: www.armstrong.com.
 - 2. CertainTeed Corporation: www.certainteed.com.
 - 3. USG: www.usg.com.
 - 4. Substitutions: See Section 01 60 00 - Product Requirements.
- B. Acoustical Units - General: ASTM E1264, Class A.
- C. Acoustical Panels: Painted mineral fiber, ASTM E1264 Type III, with the following characteristics: Match existing 60 x 30 panel size, color, texture with replacement units where damaged.
 - 1. VOC Content: Certified as Low Emission by one of the following :
 - a. GreenGuard Children and Schools; www.greenguard.org.
 - b. Product listing in the CHPS Low-Emitting Materials Product List at; www.chps.net/manual/lem_table.htm.
 - 2. Size: 60 x 30 inches. Also 24 x 48 existing panels.
 - 3. Thickness: 3/4 inches.
 - 4. Composition: Wet felted.
 - 5. Light Reflectance: 0.87 percent, determined as specified in ASTM E1264.
 - 6. NRC Range: 0.50 to 0.55, determined as specified in ASTM E1264.
 - 7. Ceiling Attenuation Class (CAC): 33, determined as specified in ASTM E1264.
 - 8. Edge: Square.
 - 9. Surface Color: White.
 - 10. Surface Pattern: Medium Texture.
 - 11. Product: Match existing by Armstrong.
 - 12. Suspension System: Exposed grid Type Match Existing System where damaged.
- D. Acoustical Panels
 - 1. VOC Content: Certified as Low Emission by one of the following :

SECTION 09 51 00

ACOUSTICAL CEILINGS

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Suspended metal grid ceiling system.
- B. Acoustical units.
- C. Replacement of damaged existing 60 x 30 and 24 x 48 acoustical boards to match existing system.
- D. Supplementary acoustical insulation above ceilings over toilet and janitor areas and at office walls not extended to metal roof deck above.

1.02 REFERENCE STANDARDS

- A. ASTM C635 - Standard Specification for the Manufacture, Performance, and Testing of Metal Suspension Systems for Acoustical Tile and Lay-in Panel Ceilings; 2007.
- B. ASTM C636/C636M - Standard Practice for Installation of Metal Ceiling Suspension Systems for Acoustical Tile and Lay-in Panels; 2008.
- C. ASTM E580/E580M - Standard Practice for Installation of Ceiling Suspension Systems for Acoustical Tile and Lay-in Panels in Areas Subject to Earthquake Ground Motions; 2011.
- D. ASTM E1264 - Standard Classification for Acoustical Ceiling Products; 2008e1.
- E. CAL (CHPS LEM) - Low-Emitting Materials Product List; California Collaborative for High Performance Schools (CHPS); current edition at www.chps.net/.
- F. GEI (SCH) - GREENGUARD "Children and Schools" Certified Products; GREENGUARD Environmental Institute; current listings at www.greenguard.org.

1.03 ADMINISTRATIVE REQUIREMENTS

- A. Sequence work to ensure acoustical ceilings are not installed until building is enclosed, sufficient heat is provided, dust generating activities have terminated, and overhead work is completed, tested, and approved.
- B. Do not install acoustical units until after interior wet work is dry.

1.04 SUBMITTALS

- A. See Section 01 30 00 - Administrative Requirements, for submittal procedures.
- B. Product Data: Provide data on suspension system components.
- C. Samples: Submit two samples 4x4 inch in size illustrating material and finish of acoustical units.
- D. Samples: Submit two samples each, 8 inches long, of suspension system main runner.
- E. Manufacturer's Installation Instructions: Indicate special procedures.
- F. Maintenance Materials: Furnish the following for City of Fernandina Beach, Florida's use in maintenance of project.
 - 1. See Section 01 60 00 - Product Requirements, for additional provisions.
 - 2. Extra Acoustical Units: 100 sq ft of each type and size.
- G. FGBC Submittal: Documentation of recycled content and location of manufacture.

2. Bostik Inc: www.bostik-us.com.
 3. Custom Building Products: www.custombuildingproducts.com.
 4. Substitutions: See Section 01 60 00 - Product Requirements.
- B. Polymer Modified Grout: ANSI A118.7 polymer modified cement grout
1. Applications: Use this type of grout where indicated and where no other type of grout is indicated.
 2. Use sanded grout for joints 1/8 inch wide and larger; use unsanded grout for joints less than 1/8 inch wide.
- C. Standard Grout: Any type specified in ANSI A118.6 or A118.7.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Verify that wall surfaces are smooth and flat within the tolerances specified for that type of work, are dust-free, and are ready to receive tile.

3.02 PREPARATION

- A. Protect surrounding work from damage.
- B. Vacuum clean surfaces and damp clean.
- C. Seal substrate surface cracks with filler.
- D. Install backer board in accordance with ANSI A108.11 and board manufacturer's instructions. Tape joints and corners, cover with skim coat of setting material to a feather edge.

3.03 INSTALLATION - GENERAL

- A. Cut and fit tile to penetrations through tile, leaving sealant joint space. Form corners and bases neatly. Align wall joints.
- B. Place tile joints uniform in width, subject to variance in tolerance allowed in tile size. Make grout joints without voids, cracks, excess mortar or excess grout, or too little grout.
- C. Form internal angles square and external angles bullnosed.
- D. Install thresholds where indicated.
- E. Sound tile after setting. Replace hollow sounding units.
- F. Keep expansion joints free of adhesive or grout. Apply sealant to joints.
- G. Prior to grouting, allow installation to completely cure; minimum of 48 hours.
- H. Grout tile joints.
- I. Apply sealant to junction of tile and dissimilar materials and junction of dissimilar planes.

3.04 CLEANING

- A. Clean tile and grout surfaces.

END OF SECTION

EXHIBIT "A"

- A. Maintain ambient and substrate temperature of 50 degrees F during installation of mortar materials.

1.07 EXTRA MATERIALS

- A. Provide 10 sq. ft of each size, color, and surface finish of tile specified.

PART 2 PRODUCTS

2.01 TILE

- A. Manufacturers: All products by the same manufacturer.
 - 1. American Olean: www.americanolean.com.
 - 2. Dal-Tile: www.daltile.com.
 - 3. Summitville Tiles, Inc: www.summitville.com.
 - 4. Substitutions: See Section 01 60 00 - Product Requirements.
- B. Glazed Wall Tile: ANSI A137.1, and as follows:
 - 1. Moisture Absorption: 3.0 to 7.0 percent.
 - 2. Size and Shape: 4-1/4 inch square.
 - 3. Edges: Cushioned.
 - 4. Surface Finish: High gloss.
 - 5. Colors: As scheduled.

2.02 TRIM AND ACCESSORIES

- A. Ceramic Trim: Matching bullnose and cove ceramic shapes in sizes coordinated with field tile.
 - 1. Applications: Use in the following locations:
 - a. Open Edges: Bullnose.
 - b. Inside Corners: Coved.
 - 2. Manufacturer: Same as for tile.
- B. Thresholds: Marble, white or gray, honed finish; 2 inches wide by full width of wall or frame opening; 1/2 inch thick; beveled one long edge with radiused corners on top side; without holes, cracks, or open seams.
 - 1. Applications: Provide at the following locations:
 - a. At doorways where tile terminates.
 - b. At open edges of floor tile where adjacent finish is a different height or slopes.

2.03 SETTING MATERIALS

- A. Provide setting materials made by the same manufacturer as grout.
- B.

2.04 MORTAR MATERIALS

- A. Manufacturers:
 - 1. Bonsal: www.bonsal.com.
 - 2. Bostik, Inc: www.bostik-us.com.
 - 3. Custom Building Products: www.custombuildingproducts.com.
 - 4. Substitutions: See Section 01 60 00 - Product Requirements.
- B. Mortar Bond Coat Materials for Thin-Set Installations:
 - 1. Dry-Set Portland Cement type: ANSI A118.1.
 - 2. Latex-Portland Cement type: ANSI A118.4.

2.05 GROUTS

- A. Manufacturers:
 - 1. Bonsal: www.bonsal.com.

SECTION 09 30 00

TILING

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Tile for wall applications.
- B. Coated glass mat backer board as tile substrate.
- C. Stone thresholds.
- D. Ceramic trim.

1.02 REFERENCE STANDARDS

- A. ANSI A108 Series/A118 Series/A136.1 - American National Standard Specifications for the Installation of Ceramic Tile (Compendium); 2012.1.
 - 1. ANSI A108.11 - American National Standard for Interior Installation of Cementitious Backer Units; 2012.1.
 - 2. ANSI A118.1 - American National Standard Specifications for Dry-Set Portland Cement Mortar; 2012.1.
 - 3. ANSI A118.4 - American National Standard Specifications for Latex-Portland Cement Mortar; 2012.1.
 - 4. ANSI A118.6 - American National Standard Specifications for Standard Cement Grouts for Tile Installation; 2012.1.
 - 5. ANSI A118.7 - American National Standard Specifications for Polymer Modified Cement Grouts for Tile Installation; 2012.1.
- B. TCNA (HB) - Handbook for Ceramic, Glass, and Stone Tile Installation; 2012.

1.03 SUBMITTALS

- A. See Section 01 30 00 - Administrative Requirements, for submittal procedures.
- B. Product Data: Provide manufacturers' data sheets on tile, mortar, grout, and accessories. Include instructions for using grouts and adhesives.
- C. Manufacturer's Certificate: Certify that products meet or exceed specified requirements.
- D. Maintenance Data: Include recommended cleaning methods, cleaning materials, stain removal methods, and polishes and waxes.
- E. FGBC Submittal: Documentation of recycled content and location of manufacture.

1.04 QUALITY ASSURANCE

- A. Maintain one copy of The Tile Council of North America Handbook and ANSI A108 Series/A118 Series on site.
- B. Manufacturer Qualifications: Company specializing in manufacturing the types of products specified in this section, with minimum 5 years of documented experience.
- C. Installer Qualifications: Company specializing in performing tile installation, with minimum of 5 years of documented experience.

1.05 DELIVERY, STORAGE, AND HANDLING

- A. Protect adhesives from freezing or overheating in accordance with manufacturer's instructions.

1.06 FIELD CONDITIONS

EXHIBIT "A"

2. Apply second coat to a nominal thickness of 3/8 inch.
 3. Apply finish coat to a nominal thickness of 1/8 inch.
- D. Three-Coat Application Over Solid Bases:
1. Apply first coat to a nominal thickness of 1/4 inch.
 2. Apply second coat to a nominal thickness of 1/4 inch.
 3. Apply finish coat to a nominal thickness of 1/8 inch.
- E. In exterior work, scribe contraction joints through entire plaster application at 10 feet on center each way.
- F. Moist cure base coats.
- G. Apply second coat immediately following initial set of first coat.
- H. After curing, dampen previous coat prior to applying finish coat.
- I. Finish Texture: Float to a consistent finish to blend with existing plaster areas.
- J. Avoid excessive working of surface. Delay troweling as long as possible to avoid drawing excess fines to surface.
- K. Moist cure finish coat for minimum period of 48 hours.
- 3.04 TOLERANCES**
- A. Maximum Variation from True Flatness: 1/8 inch in 10 feet.

END OF SECTION

EXHIBIT "A"

- A. Metal Lath and Accessories: As specified in Section 09 22 36.23. Use metal lath as plaster base at openings in existing plaster where devices are removed or new devices are installed. Provide metal lath and underlayment sheathing with membrane at metal framed exterior areas and at masonry edges, joints, trim and corners. Provide framing to secure new fixtures and devices to existing ceiling system. Provide metal lath with backing paper over masonry backed areas.
- B. Beads, Screeds, and Joint Accessories: As specified in Section 09 22 36.23.

2.04 PLASTER MIXES

- A. Over Solid Bases: Three-coat application, mixed and proportioned in accordance with manufacturer's instructions. Provide over masonry or concrete faced walls where insulation and dampproofing occur at an inner wythe.
- B. Over Metal Lath: Three-coat application, mixed and proportioned in accordance with manufacturer's instructions.
- C. Premixed Plaster Materials: Mix in accordance with manufacturer's instructions.
- D. Mix only as much plaster as can be used prior to initial set.
- E. Mix materials dry, to uniform color and consistency, before adding water.
- F. Protect mixtures from freezing, frost, contamination, and excessive evaporation.
- G. Do not retemper mixes after initial set has occurred.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Verify the suitability of existing conditions before starting work.
- B. Masonry: Verify joints are cut flush and surface is ready to receive work of this section. Verify no bituminous or water repellent coatings exist on masonry surface.
- C. Concrete: Verify surfaces are flat, honeycomb are filled flush, and surfaces are ready to receive work of this section. Verify no bituminous, water repellent, or form release agents exist on concrete surface that are detrimental to plaster bond.
- D. Metal Lath and Accessories: Verify lath is flat, secured to substrate, and joint and surface perimeter accessories are in place.
- E. Mechanical and Electrical: Verify services within walls have been tested and approved.

3.02 PREPARATION

- A. Dampen masonry surfaces to reduce excessive suction.
- B. Clean concrete surfaces of foreign matter. Clean surfaces using acid solutions, solvents, or detergents. Wash surfaces with clean water.
- C. Roughen smooth concrete surfaces and apply bonding agent in accordance with manufacturer's instructions.

3.03 PLASTERING

- A. Apply premixed plaster in accordance with manufacturer's instructions.
- B. Apply plaster in accordance with ASTM C926.
- C. Three-Coat Application Over Metal Lath:
 - 1. Apply first coat to a nominal thickness of 3/8 inch.

SECTION 09 24 00

PORTLAND CEMENT PLASTERING

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Portland cement plaster for installation over metal lath and solid surfaces at interior soffits.
- B. New exterior stucco wall and soffit areas over metal lath and solid surfaces.
- C. Repair, patching and closure of existing fixture openings where fixtures are removed, in exposed interior areas to match existing plaster finish and texture.

1.02 REFERENCE STANDARDS

- A. ASTM C926 - Standard Specification for Application of Portland Cement-Based Plaster; 2012a.

1.03 SUBMITTALS

- A. See Section 01 30 00 - Administrative Requirements, for submittals procedures.
- B. Product Data: Provide data on plaster materials, characteristics and limitations of products specified.
- C. Samples: Submit two samples, 24x24 inch in size illustrating finish color and texture.

1.04 QUALITY ASSURANCE

- A. Installer Qualifications: Company specializing in performing the work of this section with minimum 5 years of experience.

1.05 FIELD CONDITIONS

- A. Do not apply plaster when substrate or ambient air temperature is under 50 degrees F or over 80 degrees F.

PART 2 PRODUCTS

2.01 PORTLAND CEMENT PLASTER ASSEMBLIES

- A. Exterior Stucco: Portland cement plaster system, made of finish, brown, and scratch coat and reinforcing mesh.
 - 1. Provide weather resistive barrier and air barrier as part of the system, by the same manufacturer.

2.02 PLASTER MATERIALS

- A. Portland Cement, Aggregates, and Other Materials: In accordance with ASTM C926.
- B. Premixed Plaster for Stucco Scratch, Brown, and Finish Coats: Complying with material requirements of ASTM C926.
- C. Premixed Base Coat: manufactured type.
- D. Premixed Textured Coating: Polymer modified acrylic coating, integrally colored, trowel applied to substrates prepared in accordance with manufacturer's recommendations.
 - 1. Color: As indicated on drawings.
- E. Water: Clean, fresh, potable and free of mineral or organic matter that could adversely affect plaster.

2.03 METAL LATH

EXHIBIT "A"

2. At exterior soffits, not more than 30 feet apart in both directions.
- B. Corner Beads: Install at external corners, using longest practical lengths.
- C. Edge Trim: Install at locations where gypsum board abuts dissimilar materials and as indicated.

4.06 JOINT TREATMENT

- A. Glass Mat Faced Gypsum Sheathing Board: Use fiberglass joint tape, bedded and finished with chemical hardening type joint compound.
- B. Abuse Resistant/Moisture Resistant Gypsum Board. Use fiberglass joint tape and vinyl-based joint compound.
- C. Finish gypsum board in accordance with levels defined in ASTM C840, as follows:
 1. Level 4: Walls and ceilings to receive paint finish or wall coverings, unless otherwise indicated.
 2. Level 1: Fire rated wall areas above finished ceilings, whether or not accessible in the completed construction.
- D. Finish gypsum board in scheduled areas in accordance with levels defined in ASTM C 840 and as scheduled below.
 1. Above Finished Ceilings Concealed From View: Level 1.
 2. Utility Areas and Areas Behind Cabinetry: Level 2.
 3. Walls and Ceilings to Receive Flat or Eggshell Paint Finish: Level 4.
 4. Walls and Ceilings to Receive Semi-Gloss or Gloss Paint Finish: Level 5.
- E. Tape, fill, and sand exposed joints, edges, and corners to produce smooth surface ready to receive finishes.
 1. Feather coats of joint compound so that camber is maximum 1/32 inch.
- F. Where Level 5 finish is indicated, spray apply high build drywall surfacer over entire surface after joints have been properly treated; achieve a flat and tool mark-free finish.
- G. Spray apply high build drywall surfacer over entire surface after joints have been properly treated to achieve Level 5 finish in areas indicated.

4.07 TOLERANCES

- A. Maximum Variation of Finished Gypsum Board Surface from True Flatness: 1/8 inch in 10 feet in any direction.

4.08 FINISH LEVEL SCHEDULE

- A. Level 1: Above finished ceilings concealed from view.
- B. Level 2: Utility areas and areas behind cabinetry.
- C. Level 5: Walls and ceilings scheduled to receive semi-gloss or gloss paint finish.

END OF SECTION

EXHIBIT "A"

- A. Metal Framing: Install in accordance with ASTM C754 and manufacturer's instructions.
- B. Suspended Ceilings and Soffits: Space framing and furring members as indicated.
 - 1. Level ceiling system to a tolerance of 1/1200.
 - 2. Laterally brace entire suspension system.
- C. Studs: Space studs as indicated.
 - 1. Extend partition framing to structure in all locations.
 - 2. Partitions Terminating at Ceiling: Attach ceiling runner securely to ceiling track in accordance with manufacturer's instructions.
 - 3. Partitions Terminating at Structure: Attach top runner to structure, maintain clearance between top of studs and structure, and connect studs to track using specified mechanical devices in accordance with manufacturer's instructions; verify free movement of top of stud connections; do not leave studs unattached to track.
- D. Openings: Reinforce openings as required for weight of doors or operable panels, using not less than double studs at jambs. Extend double studs full height of partition.
- E. Standard Wall Furring: Install at concrete walls scheduled to receive gypsum board, not more than 4 inches from floor and ceiling lines and abutting walls. Secure in place on alternate channel flanges at maximum 24 inches on center.
 - 1. Orientation: Horizontal.
- F. Blocking: Install wood blocking for support of:
 - 1. Framed openings.
 - 2. Wall mounted cabinets.
 - 3. Plumbing fixtures.
 - 4. Toilet partitions.
 - 5. Toilet accessories.
 - 6. Wall mounted door hardware.

4.03 ACOUSTIC ACCESSORIES INSTALLATION

- A. Acoustic Insulation: Place tightly within spaces, around cut openings, behind and around electrical and mechanical items within partitions, and tight to items passing through partitions.
- B. Acoustic Sealant: Install in accordance with manufacturer's instructions.
 - 1. Place one bead continuously on substrate before installation of perimeter framing members.
 - 2. In non-fire-rated construction, seal around all penetrations by conduit, pipe, ducts, and rough-in boxes.

4.04 BOARD INSTALLATION

- A. Comply with ASTM C 840 and manufacturer's instructions. Install to minimize butt end joints, especially in highly visible locations.
- B. Single-Layer Non-Rated: Install gypsum board in most economical direction, with ends and edges occurring over firm bearing.
- C. Fire-Rated Construction: Install gypsum board in strict compliance with requirements of assembly listing.
- D. Installation on Metal Framing: Use screws for attachment of all gypsum board.
- E. Moisture Protection: Treat cut edges and holes in moisture resistant gypsum board and exterior gypsum soffit board with sealant.

4.05 INSTALLATION OF TRIM AND ACCESSORIES

- A. Control Joints: Place control joints consistent with lines of building spaces and as indicated.
 - 1. Not more than 30 feet apart on walls and ceilings over 50 feet long.

EXHIBIT "A"

- b. Thickness: 5/8 inch.
 - c. Edges: Tapered.
- E. Water-Resistant Gypsum Board: ASTM C 630/C 630M and ASTM C 1396/C 1396M; ends square cut.
- 1. Application: at both sides of gypsum board closure walls around Electrical, Mechanical, Toilet, Storage and Janitor areas. Also provide in toilet rooms on walls to be painted.
 - 2. Core Type: Regular and Type X, as indicated.
 - 3. Thickness: 5/8 inch.
 - 4. Edges: Tapered.
- F. Exterior Sheathing Board: Sizes to minimize joints in place; ends square cut.
- 1. Application: Exterior sheathing, unless otherwise indicated.
 - 2. Glass-Mat-Faced Sheathing: Glass mat faced gypsum substrate as defined in ASTM C1177/C1177M.
 - 3. Core Type: Regular and Type X, as indicated.
 - 4. Type X Thickness: 5/8 inch.
 - 5. Edges: Square, for vertical application.

3.04 ACCESSORIES

- A. Acoustic Insulation: ASTM C 665; preformed glass fiber, friction fit type, unfaced. Thickness: 3 inch.at metal stud areas.
- B. Acoustic Sealant: As specified in Section 07 90 05.
- C. Water-Resistive Barrier: No. 15 asphalt felt.
- D. Finishing Accessories: ASTM C1047, galvanized steel or rolled zinc, unless otherwise indicated.
 - 1. Types: As detailed or required for finished appearance.
- E. Joint Materials: ASTM C475 and as recommended by gypsum board manufacturer for project conditions.
 - 1. Tape: 2 inch wide, coated glass fiber tape for joints and corners, except as otherwise indicated.
 - 2. Chemical hardening type compound.
- F. High Build Drywall Surfacer: Vinyl acrylic latex-based coating for spray application, designed to take the place of skim coating and separate paint primer in achieving Level 5 finish at exposed to view areas in Outside Storage, Janitor and Mechanical areas.
- G. Screws for Attachment to Steel Members Less Than 0.03 inch In Thickness, to Wood Members, and to Gypsum Board: ASTM C1002; self-piercing tapping type; cadmium-plated for exterior locations.
- H. Screws for Attachment to Steel Members From 0.033 to 0.112 inch in Thickness: ASTM C954; steel drill screws for application of gypsum board to loadbearing steel studs.
- I. Screws: ASTM C 1002; self-piercing tapping type; cadmium-plated for exterior locations.
- J. Anchorage to Substrate: Tie wire, nails, screws, and other metal supports, of type and size to suit application; to rigidly secure materials in place.

PART 3 EXECUTION

4.01 EXAMINATION

- A. Verify that project conditions are appropriate for work of this section to commence.

4.02 FRAMING INSTALLATION

EXHIBIT "A"

1. Structural Performance: Maintain lateral load resistance and vertical movement capacity required by applicable code, when evaluated in accordance with AISI North American Specification for the Design of Cold-Formed Steel Structural Members.
2. Material: ASTM A653/A653M steel sheet, SS Grade 50/340, with G60/Z180 hot dipped galvanized coating.
3. Provide components UL-listed for use in UL-listed fire-rated head of partition joint systems of fire rating and movement required.
4. Deflection and Firestop Track:
 - a. Provide mechanical anchorage devices as described above that accommodate deflection while maintaining the fire-rating of the wall assembly.
5. Provide top track preassembled with connection devices spaced to fit stud spacing indicated on drawings; minimum track length of 12 feet.
6. Acceptable Products: VertiClip(r) or VertiTrack(tm) manufactured by The Steel Network Inc.

3.03 BOARD MATERIALS

- A. Manufacturers - Gypsum-Based Board:
 1. Georgia-Pacific Gypsum: www.gpgypsum.com.
 2. Lafarge North America Inc: www.lafargenorthamerica.com.
 3. National Gypsum Company: www.nationalgypsum.com.
 4. USG Corporation: www.usg.com.
 5. Substitutions: See Section 01 60 00 - Product Requirements.
- B. Impact-Rated Wallboard: Tested to Level 3 soft-body and hard-body impact in accordance with ASTM C1629.
 1. Application: High-traffic areas indicated.
 2. Mold Resistance: Score of 10, when tested in accordance with ASTM D3273.
 3. Paper-Faced Type: Gypsum wallboard as defined in ASTM C1396/C1396M.
 4. Unfaced Type: Interior fiber-reinforced gypsum panels as defined in ASTM C1278/C1278M.
 5. Type: Fire-resistance rated Type X, UL or WH listed.
 6. Thickness: 5/8 inch.
 7. Edges: Tapered.
 8. Products:
 - a. National Gypsum Company; Gold Bond Hi-Impact Brand XP Wallboard.
 - b. USG Corporation; Fiberock Brand Panels--VHI Abuse-Resistant.
- C. Backing Board For Wet Areas: One of the following products:
 1. Application: Surfaces behind tile in wet areas including Toilet wet walls with ceramic tile.
 2. Glass-Mat-Faced Board: Coated glass mat water-resistant gypsum backing panel as defined in ASTM C1178.
 - a. Standard Type: Thickness 5/8 inch.
 - b. Fire-Resistant Type: Type X core, thickness 5/8 inch.
- D. Gypsum Wallboard: ASTM C 1396/C 1396M. Sizes to minimize joints in place; ends square cut.
 1. Regular Type: (at typical partitions)
 - a. Application: Use for vertical surfaces, unless otherwise indicated.
 - b. Thickness: 5/8 inch.
 - c. Edges: Tapered.
 2. Type X: Fire resistant, UL or WH rated. (at Fire Rated Partitions)
 - a. At Assemblies Indicated with Fire-Rating: Use type required by indicated tested assembly; if no tested assembly is indicated, use Type X.
 - b. Application: Where required for fire-rated assemblies, unless otherwise indicated.
 - c. Thickness: 5/8 inch.
 - d. Edges: Tapered.
 3. Ceiling Board: Special sag-resistant type. (At interior Gypsum Board Ceilings)
 - a. Application: Ceilings, unless otherwise indicated.

- B. Installer Qualifications: Company specializing in performing gypsum board application and finishing, with minimum 5 years of documented experience.

2.06 REGULATORY REQUIREMENTS

- A. Conform to applicable code for fire rated assemblies as follows:
1. Fire Rated Partitions: Listed assembly by UL, No. U465;; 1 hour rating.
 2. Head of Fire Rated Partitions: Listed assembly by UL, No. U465; 1 hour rating.
 3. Fire Rated Ceiling: Listed assembly by UL, No. P522; 1 hour rating.

PART 2 PRODUCTS

3.01 GYPSUM BOARD ASSEMBLIES

- A. Provide completed assemblies complying with ASTM C840 and GA-216.
- B. Interior Partitions: Provide completed assemblies with the following characteristics:
1. Acoustic Attenuation: STC of 45-49 calculated in accordance with ASTM E413, based on tests conducted in accordance with ASTM E90.
- C. Fire Rated Assemblies: Provide completed assemblies with the following characteristics:
1. Fire Rated Partitions: UL listed assembly No. U465; 1 hour rating.
 2. Gypsum Association File Numbers: Comply with requirements of GA-600 for the particular assembly.
 3. UL Assembly Numbers: Provide construction equivalent to that listed for the particular assembly in the current UL Fire Resistance Directory.

3.02 METAL FRAMING MATERIALS

- A. Manufacturers - Metal Framing, Connectors, and Accessories:
1. Clarkwestern Dietrich Building Systems LLC: www.clarkdietrich.com.
 2. Dale/Incor: www.daleincor.com.
 3. Dietrich Metal Framing: www.dietrichindustries.com.
 4. MarinoWare: www.marinoware.com.
 5. Substitutions: See Section 01 60 00 - Product Requirements.
- B. Metal Framing Connectors and Accessories:
1. Same manufacturer as framing.
- C. Non-Loadbearing Framing System Components: ASTM C645; galvanized sheet steel, of size and properties necessary to comply with ASTM C754 for the spacing indicated, with maximum deflection of wall framing of L/240 at 5 psf.
1. Exception: The minimum metal thickness and section properties requirements of ASTM C 645 are waived provided steel of 40 ksi minimum yield strength is used, the metal is continuously dimpled, the effective thickness is at least twice the base metal thickness, and maximum stud heights are determined by testing in accordance with ASTM E 72 using assemblies specified by ASTM C 754.
 2. Studs: "C" shaped with flat or formed webs with knurled faces.
 3. Runners: U shaped, sized to match studs.
 4. Ceiling Channels: C shaped.
 5. Furring: Hat-shaped sections, minimum depth of 7/8 inch.
- D. Ceiling Hangers: Type and size as specified in ASTM C754 for spacing required.
- E. Partition Head To Structure Connections: Provide track fastened to structure with legs of sufficient length to accommodate deflection, for friction fit of studs cut short.
- F. Fire Rated Partition Head to Structure Connections: Provide mechanical anchorage devices that accommodate deflection using slotted holes, screws and anti-friction bushings, preventing rotation of studs while maintaining structural performance of partition.

EXHIBIT "A"

- M. ASTM C1047 - Standard Specification for Accessories for Gypsum Wallboard and Gypsum Veneer Base; 2010a.
- N. ASTM C1177/C1177M - Standard Specification for Glass Mat Gypsum Substrate for Use as Sheathing; 2008.
- O. ASTM C1278/C1278M - Standard Specification for Fiber-Reinforced Gypsum Panel; 2007a (Reapproved 2011).
- P. ASTM C1280 - Standard Specification for Application of Gypsum Sheathing; 2012.
- Q. ASTM C1396/C1396M - Standard Specification for Gypsum Board; 2011.
- R. ASTM C1629/C1629 - Standard Classification for Abuse-Resistant Nondecorated Interior Gypsum Panel Products and Fiber-Reinforced Cement Panels; 2006.
- S. ASTM D3273 - Standard Test Method for Resistance to Growth of Mold on the Surface of Interior Coatings in an Environmental Chamber; 2012.
- T. ASTM E90 - Standard Test Method for Laboratory Measurement of Airborne Sound Transmission Loss of Building Partitions and Elements; 2009.
- U. ASTM E413 - Classification for Rating Sound Insulation; 2010.
- V. GA-214 - Recommended Levels of Gypsum Board Finish; Gypsum Association; 2007.
- W. GA-216 - Application and Finishing of Gypsum Board; Gypsum Association; 2010.
- X. GA-600 - Fire Resistance Design Manual; Gypsum Association; 2009.
- Y. UL (FRD) - Fire Resistance Directory; Underwriters Laboratories Inc.; current edition.

2.03 SYSTEM DESCRIPTION

- A. Acoustic Attenuation for Temporary Construction Separation Interior Partitions: STC of 50-54 calculated in accordance with ASTM E 413, based on tests conducted in accordance with ASTM E 90.

2.04 SUBMITTALS

- A. See Section 01 30 00 - Administrative Requirements, for submittal procedures.
- B. Shop Drawings: Indicate special details associated with fireproofing and acoustic seals.
- C. Product Data: Provide data on metal framing, gypsum board, accessories, and joint finishing system.
- D. Product Data: Provide manufacturer's data on partition head to structure connectors, showing compliance with requirements.
- E. Test Reports: For all stud framing products that do not comply with ASTM C645 or C 754, provide independent laboratory reports showing maximum stud heights at required spacings and deflections.
- F. FGBC Submittals:
 - 1. For gypsum wallboard, submit documentation of recycled content and location of manufacture.
 - 2. For steel products, submit documentation of steel mill process, location of mill, and location of manufacture.

2.05 QUALITY ASSURANCE

- A. Perform in accordance with ASTM C 840. Comply with requirements of GA-600 for fire-rated assemblies.

SECTION 09 21 16

GYPSUM BOARD ASSEMBLIES

PART 1 GENERAL

2.01 SECTION INCLUDES

- A. Performance criteria for gypsum board assemblies.
- B. Metal stud wall framing.
- C. Metal channel ceiling framing.
- D. Fire rated area separation walls.
- E. Acoustic insulation.
- F. Abuse resistant/moisture resistant gypsum board.
- G. Gypsum wallboard.
- H. Glass mat faced gypsum sheathing board.
- I. Joint treatment and accessories.
- J. Water-resistive barrier over exterior wall sheathing.

2.02 REFERENCE STANDARDS

- A. AISI SG02-1 - North American Specification for the Design of Cold-Formed Steel Structural Members; American Iron and Steel Institute; 2001 with 2004 supplement. (replaced SG-971)
- B. AISI SG-971 - Specification for the Design of Cold-Formed Steel Structural Members; 1996, with 2000 Supplement.
- C. ASTM A653/A653M - Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process; 2011.
- D. ASTM C 36/C 36M - Standard Specification for Gypsum Wallboard; 2001.
- E. ASTM C475/C475M - Standard Specification for Joint Compound and Joint Tape for Finishing Gypsum Board; 2002 (Reapproved 2007).
- F. ASTM C 630/C 630M - Standard Specification for Water-Resistant Gypsum Backing Board; 2000.
- G. ASTM C645 - Standard Specification for Nonstructural Steel Framing Members; 2011a.
- H. ASTM C665 - Standard Specification for Mineral-Fiber Blanket Thermal Insulation for Light Frame Construction and Manufactured Housing; 2012.
- I. ASTM C754 - Standard Specification for Installation of Steel Framing Members to Receive Screw-Attached Gypsum Panel Products; 2011.
- J. ASTM C840 - Standard Specification for Application and Finishing of Gypsum Board; 2011.
- K. ASTM C954 - Standard Specification for Steel Drill Screws for the Application of Gypsum Panel Products or Metal Plaster Bases to Steel Studs From 0.033 in. (0.84 mm) to 0.112 in. (2.84 mm) in Thickness; 2011.
- L. ASTM C1002 - Standard Specification for Steel Self-Piercing Tapping Screws for the Application of Gypsum Panel Products or Metal Plaster Bases to Wood Studs or Steel Studs; 2007.

EXHIBIT "A"

- C. Install sealants in accordance with ASTM C1193 and GANA Sealant Manual.
- D. Install sealant in accordance with manufacturer's instructions.

3.03 INSTALLATION - EXTERIOR WET/DRY METHOD (PREFORMED TAPE AND SEALANT)

- A. Cut glazing tape to length and set against permanent stops, 3/16 inch below sight line. Seal corners by butting tape and dabbing with butyl sealant.
- B. Apply heel bead of butyl sealant along intersection of permanent stop with frame ensuring full perimeter seal between glass and frame to complete the continuity of the air and vapor seal.
- C. Place setting blocks at 1/4 points with edge block no more than 6 inches from corners.
- D. Rest glazing on setting blocks and push against tape and heel bead of sealant with sufficient pressure to attain full contact at perimeter of pane or glass unit.
- E. Install removable stops, with spacer strips inserted between glazing and applied stops, 1/8 inch below sight line. Place glazing tape on glazing pane or unit with tape flush with sight line.
- F. Fill gap between glazing and stop with sealant to depth equal to bite of frame on glazing, but not more than 3/8 inch below sight line.
- G. Apply cap bead of sealant along void between the stop and the glazing, to uniform line, flush with sight line. Tool or wipe sealant surface smooth.

3.04 INSTALLATION - INTERIOR WET/DRY METHOD (TAPE AND SEALANT)

- A. Cut glazing tape to length and install against permanent stops, projecting 1/16 inch (1.6 mm) above sight line.
- B. Place setting blocks at 1/4 points with edge block no more than 6 inches from corners.
- C. Rest glazing on setting blocks and push against tape to ensure full contact at perimeter of pane or unit.
- D. Install removable stops, spacer shims inserted between glazing and applied stops at 24 inch intervals, 1/4 inch below sight line.
- E. Fill gaps between pane and applied stop with sealant to depth equal to bite on glazing, to uniform and level line.
- F. Trim protruding tape edge.

3.05 CLEANING

- A. Remove glazing materials from finish surfaces.
- B. Remove labels after Work is complete.
- C. Clean glass and adjacent surfaces.

END OF SECTION

1. Comply with ASTM C 1036, Type I, transparent flat, Class 1 clear, Quality Q3 (glazing select) and ASTM C 1048.
2. Comply with 16 CFR 1201 test requirements for Category II.
3. 6 mm minimum thick. Provide thickness required for safety glass in frame size indicated.
 - a. Interior locations: Glazed view windows, sidelites, transoms and doors.

2.03 GLAZING COMPOUNDS

- A. Manufacturers:
 1. Bostik Inc: www.bostik-us.com.
 2. Dow Corning Corp: www.dowcorning.com.
 3. GE Plastics: www.geplastics.com.
 4. Pecora Corporation: www.pecora.com.
 5. BASF Construction Chemicals-Building Systems: www.buildingsystems.basf.com.
 6. Substitutions: Refer to Section 01 60 00 - Product Requirements.
- B. Butyl Sealant: Single component; ASTM C 920, Grade NS, Class 12-1/2, Uses M and A; Shore A hardness of 10 to 20; black color; non-skinning.
- C. Polyurethane Sealant: Single component, chemical curing, non-staining, non-bleeding; ASTM C 920, Type S, Grade NS, Class 25, Uses M, A, and G; Shore A Hardness Range 20 to 35; matching color.
- D. 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; matching color.

2.04 GLAZING ACCESSORIES

- A. Manufacturers:
 1. Pecora Corporation: www.pecora.com.
 2. Saint-Gobain Performance Plastics: www.plastics.saint-gobain.com.
 3. Tremco, Inc: www.tremcosealants.com.
 4. Substitutions: Refer to Section 01600 - Product Requirements.
- B. Setting Blocks: Neoprene, 80 to 90 Shore A durometer hardness, ASTM C864 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.
- C. 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.
- D. Glazing Tape: Preformed butyl compound with integral resilient tube spacing device; 10 to 15 Shore A durometer hardness; coiled on release paper, black 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. Prime surfaces scheduled to receive sealant.

EXHIBIT "A"

- A. See Section 01 30 00 - Administrative Requirements, for submittal procedures.
- 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 6x6 inch in size of glass units.
- E. Certificates: Certify that products meet or exceed specified requirements.
- F. Manufacturer's Certificate: Certify that glass meets or exceeds specified requirements.

1.05 WARRANTY

- A. See Section 01 78 00 - Closeout Submittals, for additional warranty requirements.
- B. Laminated Glass: Provide a five (5) year warranty to include coverage for delamination, including replacement of failed units.
- C. Provide two of each exterior glass size and each glass type, of window.

PART 2 PRODUCTS

2.01 GLAZING TYPES

2.02 GLASS MATERIALS

- A. Float Glass Manufacturers:
 - 1. AGC Flat Glass North America, Inc: www.na.agc-flatglass.com.
 - 2. Guardian Industries Corporation: www.guardian.com.
 - 3. Pilkington North America Inc: www.pilkington.com/na.
 - 4. PPG Industries, Inc: www.ppgideascales.com.
 - 5. Visteon Glass Systems: www.visteon.com/floatglass.
 - 6. 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.
- C. Laminated Glass: Float glass laminated in accordance with ASTM C1172.
 - 1. Laminated Safety Glass: Comply with 16 CFR 1201 test requirements for Category II.
 - 2. Plastic Interlayer: 0.060 inch thick, minimum.
 - 3. Medium Bronze Tinted glass on exterior face, except Clear glass in doors.
 - 4. Where fully tempered is specified or required, provide glass that has been tempered by the tong-less horizontal method.
- D. Interior areas: Clear Float Glass: Clear, fully tempered.
 - 1. Comply with ASTM C 1036, Type I, transparent flat, Class 1 clear, Quality Q3 (glazing select).
 - 2. 6 mm minimum thick.
- E. Exterior Glazing of doors and windows: Bronze tinted 7/16 or 9/16 inch Saf-Glas by Security Impact Glass, as required for large missile Impact tested windows.
- F. Interior Safety Glass: Clear; fully tempered with horizontal tempering.

SECTION 08 80 00

GLAZING

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Glass.
- B. Glazing compounds and accessories.

1.02 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; 2010.
- C. ASTM C864 - Standard Specification for Dense Elastomeric Compression Seal Gaskets, Setting Blocks, and Spacers; 2005 (Reapproved 2011).
- D. ASTM C920 - Standard Specification for Elastomeric Joint Sealants; 2011.
- E. ASTM C1036 - Standard Specification for Flat Glass; 2011e1.
- F. ASTM C1048 - Standard Specification for Heat-Treated Flat Glass—Kind HS, Kind FT Coated and Uncoated Glass; 2012.
- G. ASTM C1172 - Standard Specification for Laminated Architectural Flat Glass; 2009e1.
- H. ASTM C1193 - Standard Guide for Use of Joint Sealants; 2011a.
- I. ASTM E1300 - Standard Practice for Determining Load Resistance of Glass in Buildings; 2012a.
- J. GANA (SM) - GANA Sealant Manual; Glass Association of North America; 2008.
- K. GANA (LGDG) - Laminated Glazing Reference Manual; Glass Association of North America; 2009.
- L. SIGMA TM-3000 - Glazing Guidelines for Sealed Insulating Glass Units; Sealed Insulating Glass Manufacturers Association; 2004.

1.03 PERFORMANCE REQUIREMENTS

- A. Provide glass and glazing materials for continuity of building enclosure vapor retarder and air barrier:
 - 1. To maintain a continuous air barrier and vapor retarder throughout the glazed assembly from glass pane to heel bead of glazing sealant.
- B. All exterior glazing in windows and doors must be certified to meet FBC High Wind Debris Impact Zone Test and 130 MPH wind load. All windows shall be successfully tested for resistance to penetration by flying missiles and cyclic loading per SSTD 12, ASTM E1886, ASTM E1996 or Miami-Dade TAS 201, 202, or 203. FBC Section 1606.1.4.
- C. Select type and thickness of exterior glass to withstand dead loads and wind loads acting normal to plane of glass at design pressures calculated in accordance with FBC 2010 code.
 - 1. Use the procedure specified in ASTM E 1300 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.

1.04 SUBMITTALS

EXHIBIT "A"

MISCELLANEOUS

LOCK GUARD IS AS MANUFACTURED BY PRECISION HARDWARE INC., AND IS TO BE PROVIDED FOR ALL EXTERIOR DOORS WITH CYLINDRICAL LOCK OPENING OUT. PROVIDE WIDE THROW HINGES AS INDICATED AND REQUIRED AT EXTERIOR OPENING OUT. PROVIDE WIDE THROW HINGES AS INDICATED AND REQUIRED AT EXTERIOR DOORS TO CLEAR MASONRY AND PROVIDE A 180 DEGREE SWING WHERE APPLICABLE.

END OF SECTION

EXHIBIT "A"

1 EA	KICK PLATE	190S	12 X 2 LDW	630
1 EA	W/S SET	303AS	LAR	AL
1 EA	THRESHOLD	171A	LAR	AL
1 EA	DOOR BOTTOM	217A	LAR	AL
1 EA	OVERHEAD DRIP	346D		DBA
1 EA	PRISON STOP	269F	US2C	HA

DOOR TO HAVE: SET #7 TOILET PRIVACY
DOORS: 124

3 EA	HINGE	BB1191	4.5 X 4.5	630
1 EA	PRIVACY	AU 5402 LN		626
1 EA	CLOSER	PR 3501 BF		689
1 EA	KICK PLATE	190S	12 X 2 LDW	630
1 EA	STOP	243F		626

DOOR TO HAVE: SET #8 JANITORIAL, STORAGE
DOORS: 104, 105, 107, 114, 120, 121, 123, 129

3 EA HINGE(S)	BB1279 4 ½ X 4 ½	US26D	HA
1 EA LOCK SET	AU 5405LN F494 497 GGMK	US26D	YA
			KNARLED HANDLE
1 EA KICK PLATE(S)	190S 18" X 34"	US32D	HA
1 EA FLOOR STOP(S)	241F	US26D	HA
3 EA DOOR SILENCER(S)	307D	GREY	HA
1 EA CLOSER	3501 BF TBGN	SB	YA

DOOR TO HAVE: SET #9 ALUMINUM DOOR
SINGLE DOOR 126

1 EA	LOCKSET	AU 5408 LM	626
1 EA	CYLINDERS KEYED TO LOCK SYSTEM		

EXHIBIT "A"

DOOR TO HAVE: SET #3 ALUMINUM DOORS
PAIR DOORS 102

2 EA	EXIT DEVICE	7120 X 7120 CONCEALED RODS		626
2 EA	CYLINDERS KEYED TO LOCK SYSTEM			

DOOR TO HAVE: SET #4 EXTERIOR EXIT
DOORS: 103A, 115, 128 METAL DOOR

3 EA	HINGE	BB1199 NRP	4.5 X 4.5	630
1 EA	EXIT DEVICE	7150 AU 626F	RIM	630
1 EA	CYLINDER	1109		626
1 EA	CLOSER	PR 3501 BF		689
1 EA	KICK PLATE	190S	12 X 2 LDW	630
1 EA	W/S SET	303AS	LAR	AL
1 EA	DOOR BOTTOM	217APK	LAR	AL
1 EA	THRESHOLD	171A	LAR	AL
1 EA	PRISON STOP	269F	US2C	HA
1EA	OVERHEAD DRIP			

DOOR TO HAVE: SET #5 OFFICE
DOORS: 112, 115A, 117, 118, 119, 122

3 EA	HINGE	BB1199 NRP	4.5 X 4.5	626
1 EA	LOCKSET	AU 5408 LN		626
2 EA	CLOSER	PR 3501 BF		689
1 EA	KICK PLATE	190S	12 X 2 LDW	630
1 EA	STOP	267F		

DOOR TO HAVE: SET #6 EXTERIOR MECHANICAL, ELECTRICAL
DOORS: 101

3 EA	HINGE	BB1199 NRP	4.5 X 4.5	626
1 EA	LOCKSET	AU 5405 LN		626
1 EA	HOLD OPEN	4 - 326 SERIES 4 RIXSON		689

EXHIBIT "A"

SECTION 08 71 00

DOOR HARDWARE

SCHEDULE AS FOLLOWS:

HARDWARE SETS: IT IS INTENDED THAT THE FOLLOWING LIST OF HARDWARE COVERS ALL HARDWARE REQUIRED TO COMPLETE THIS PROJECT. THE BIDDERS SHALL CHECK THE DRAWINGS AND ADVISE THE ARCHITECT, DURING THE BID PERIOD, OF ANY OMISSIONS OR DISCREPANCIES.

FERNANDINA BEACH BRANCH LIBRARY

DOOR TO HAVE: SET #1 INTERIOR PAIR (WOOD)

DOORS: 103, 110, 113

6 EA	HINGE	BB1199 NRP	4.5 X 4.5	630
1 EA	EXIT DEVICE	7110 x 7110	AU 626F Surface Rods	630
2 EA	CYLINDER	2153		626
2 EA	CLOSER	PR 3501 BF		689
2 EA	FLUSH BOLTS	2820/280X	HAGAR	626
2 EA	KICK PLATE	190S	12 X 2 LDW	630

DOOR TO HAVE: SET #2 GROUP TOILETS

DOORS: 108, 109

3 EA HINGE(S)	BB1279 4 1/2 X 4 1/2	US26D	HA
1 EA PUSH PLATE	A30S 4 X 16 X 0.062	US320	HA
1 EA PULL PLATE	A30 4 X 16 X 0.062	US320	HA
1 EA CLOSER	3501 BF TBGN	SB	YA
1 EA KICK PLATE(S)	190S 18" X 34"	US32D	HA
1 EA FLOOR STOPS(S)	241F	US26D	HA
3 EA DOOR SILENCER(S)	307D	GREY	HA

EXHIBIT "A"

and installation has been furnished and installed in accordance with manufacturer's instructions and as specified.

3.04 ADJUSTING

- A. Adjust work under provisions of Section 01 70 00.
- B. Adjust hardware for smooth operation.

3.05 PROTECTION

- A. Protect finished Work under provisions of Section 01 70 00.
- B. Do not permit adjacent work to damage hardware or finish.

3.06 SCHEDULE - Attached.

END OF SECTION

EXHIBIT "A"

2.18 KEYING

- A. Factory Grand Master key (GMK), Master Key (MK) all locks and cylinders to new Yale Grand Master key system
- B. Furnish 4 cut keys per lock and cylinder. Within groups keyed alike furnish 4 factory cut keys and a sufficient amount of uncut blanks to make appropriate total.
- C. Factory stamp all keys/blanks "DO NOT DUPLICATE". All keys shall be factory stamped with the bitting code, NOT the key code.
- D. Factory key all locks and cylinders at the direction of the City of Fernandina Beach authorized representative and the Architect.
- E. Submit keying schedule in DHI written format for the approval of the City of Fernandina Beach System authorized representative.
- F. Furnish the authorized representative with a factory bitting list for all keyed cylinders.
- G. Deliver all keys to the Fernandina Beach Public Library System authoized representative via: Registered Mail.
- H. Supply keys in the following quantities:
 - 1. 12 Grand Master Keys.
 - 2. 6 School Master Keys.
 - 3. 6 Sub-Master Keys.
 - 4. See enclosed keying schedule for additional keying required.
 - 5. See enclosed Keying Schedule for additional keying requirments.
- I. Cabinet Size: Size for project keys with 100 keys capacity.
- J. Finish: Baked enamel tan color

PART 3 EXECUTION

3.01 EXAMINATION

- A. Verify that doors and frames are ready to receive work; labeled, fire-rated doors and frames are present and properly installed, and dimensions are as indicated on shop drawings.
- B. Verify that electric power is available to power operated devices and of the correct characteristics.

3.02 INSTALLATION

- A. Install hardware in accordance with manufacturer's instructions and applicable codes.
- B. Use templates provided by hardware item manufacturer.
- C. Install hardware on fire-rated doors and frames in accordance with code and NFPA 80.
- D. Mounting heights for hardware from finished floor to center line of hardware item: As listed in Schedule, unless otherwise noted:
 - 1. For steel doors and frames: Comply with DHI "Recommended Locations for Architectural Hardware for Steel Doors and Frames."
 - 2. For wood doors: Comply with DHI "Recommended Locations for Architectural Hardware for Wood Flush Doors."

3.03 FIELD QUALITY CONTROL

- A. Field inspection and testing will be performed under provisions of Section 01 40 00.
- B. Provide an Architectural Hardware Consultant to inspect installation and certify that hardware

EXHIBIT "A"

1. Provide wall stops, unless otherwise indicated.
2. If wall stops are not practical, due to configuration of room or furnishings, provide overhead stop.
3. Stop is not required if positive stop feature is specified for door closer; positive stop feature of door closer is not an acceptable substitute for a stop unless specifically so stated.

B. Overhead Holders/Stops:

C. Manufacturers - Wall and Floor Stops/Holders:

2.14 GASKETING AND THRESHOLDS

A. Gasketing and Thresholds:

B. Gaskets: Complying with BHMA A156.22.

1. On each door in smoke partition, provide smoke gaskets; top, sides, and meeting stile of pairs. If fire/smoke partitions are not indicated on drawings, provide smoke gaskets on each door identified as a "smoke door" and 20-minute rated fire doors.
2. On each exterior door, provide weatherstripping gaskets, unless otherwise indicated; top, sides, and meeting stiles of pairs.
 - a. Where exterior door is also required to have fire or smoke rating, provide gaskets functioning as both smoke and weather seals.
3. On each exterior door, provide door bottom sweep, unless otherwise indicated.

C. Thresholds:

1. At each exterior door, provide a threshold unless otherwise indicated.

2.15 PROTECTION PLATES AND ARCHITECTURAL TRIM

A. Protection Plates:

B. Protection Plates:

1. Kickplate: Provide on push side of every door with closer, except storefront and all-glass doors.

2.16 KEY CONTROLS

A. Facility Manager's Key Cabinet: Sheet steel construction, piano hinged door with key lock.

1. Mounting: Wall-mounted.
2. Capacity: Actual quantity of keys, plus 25 percent additional capacity.
3. Horizontal metal hook strips with replaceable labels covered with clear plastic.
4. Size key hooks to hold 6 keys each.
5. Finish: Baked enamel, manufacturer's standard color.
6. Key cabinet lock to building keying system.

2.17 GENERAL REQUIREMENTS FOR DOOR HARDWARE PRODUCTS

A. Provide products that comply with the following:

1. Applicable provisions of Federal, State, and local codes.
2. ANSI/ICC A117.1, American National Standard for Accessible and Usable Buildings and Facilities.
3. Applicable provisions of NFPA 101, Life Safety Code.
4. Fire-Rated Doors: NFPA 80.
5. All Hardware on Fire-Rated Doors: Listed and classified by UL as suitable for the purpose specified and indicated.
6. Products Requiring Electrical Connection: Listed and classified by UL as suitable for the purpose specified and indicated.

B. Finishes: Identified in schedule at end of section.

EXHIBIT "A"

- B. Locking Functions: As defined in BHMA A156.2, and as follows:

2.07 MORTISE LOCKSETS

- A. Locking Functions: As defined in BHMA A156.13, and as follows:

2.08 FLUSHBOLTS

- A. Flushbolts: Lever extension bolts in leading edge of door, one bolt into floor, one bolt into top of frame.
1. Pairs of Swing Doors: At inactive leaves, provide flush bolts of type as required to comply with code.
 2. Floor Bolts: Provide dustproof strike except at metal thresholds.

2.09 Base Bid: Overhead Accessible Electric Automatic Opener Operation System: Install on one leaf of exterior new pair of Aluminum Storefront Entrance Doors.

- A. Manufacturer: Power Access Corporation; Telephone: 800-344-0088. www.power-access.com.
- B. Overhead Opener Model 4300 Heavy Duty Commercial Grade Door Opener. One leaf operation in exterior pair of doors. Provide total kit for full operation, connections and power modification units.
- C. At exterior pair of doors provide one electrical operator and two wall mounted electrical wired Model 4495 SFBQ 6 1/4 x 6 1/4 x 2 inch surface mounted square plates on brown formed box. Either wall pad to operate door.
- D. Door Opener is not attached to door to allow free non-activated operation. New Aluminum Door closer hardware controls closing operation. Provide Timed opening, adjustable hold open time and obstacle override.

2.10

2.11 EXIT DEVICES

- A. Exit Devices:
- B. Locking Functions: Functions as defined in BHMA A156.3, and as follows:
1. Entry/Exit, Free Swing: Double Entrance Aluminum Doors and Double Wood Doors where indicated: Key outside retracts latch, latch holdback (dogging) for free swing during occupied hours, not fire-rated; outside trim must be specified as lever or pull. (Accessible electric opener on one leaf of pair of aluminum doors)
 2. Entry/Exit, Always-Latched: Single Doors: Key outside locks and unlocks lever, no latch holdback (dogging).

2.12 CLOSERS

- A. Closers:
- B. Closers: Complying with BHMA A156.4.
1. Provide surface-mounted, door-mounted closers unless otherwise indicated.
 2. Provide a door closer on every exterior door.
 3. Provide a door closer on every fire- and smoke-rated door. Spring hinges are not an acceptable self-closing device unless specifically so indicated.
 4. On pairs of swinging doors, if an overlapping astragal is present, provide coordinator to ensure the leaves close in proper order.

2.13 STOPS AND HOLDERS

- A. Stops: Complying with BHMA A156.8; provide a stop for every swinging door, unless otherwise indicated.

EXHIBIT "A"

- E. Finishes: All door hardware the same finish unless otherwise indicated.
 - 1. Primary Finish: Satin chrome plated over nickel on brass or bronze, 626 (approx US26D).
 - 2. Finish Definitions: BHMA A156.18.
 - 3. Exceptions:
 - a. Where base metal is specified to be different, provide finish that is an appearance equivalent according to BHMA A156.18.
 - b. Hinges for Fire-Rated Doors: Steel base metal with plated finish.
 - c. Door Closer Covers and Arms: Color to be selected by Architect from manufacturer's standard colors.
 - d. Aluminum Surface Trim and Gasket Housings: Anodized to match door, not to match other hardware.
 - e. Hardware for Aluminum Storefront Doors: Finished to match door, except hand contact surfaces to be satin stainless steel.
- F. Fasteners:
 - 1. Concrete and Masonry Substrates: Stainless steel machine screws and lead expansion shields.

2.03 HINGES

- A. Hinges:
- B. Hinges: Provide hinges on every swinging door.
 - 1. Provide five-knuckle full mortise butt hinges unless otherwise indicated.
 - 2. Provide ball-bearing hinges at all doors having closers.
 - 3. Provide hinges in the quantities indicated.
 - 4. Provide non-removable pins on exterior outswinging doors.

2.04 PUSH/PULLS

- A. Yale: www.yalesecurity.com.
- B. Push/Pulls:
- C. Push/Pulls: Comply with BHMA A156.6.
 - 1. Provide push and pull on doors not specified to have lockset, latchset, exit device, or auxiliary lock.
 - 2. On solid doors, provide matching push plate and pull plate on opposite faces.

2.05 LOCKS AND LATCHES

- A. Locks: Provide a lock for every door, unless specifically indicated as not requiring locking.
 - 1. Hardware Sets indicate locking functions required for each door.
 - 2. If no hardware set is indicated for a swinging door provide an office lockset.
 - 3. Trim: Provide lever handle or pull trim on outside of all locks unless specifically stated to have no outside trim.
 - 4. Lock Cylinders: Provide key access on outside of all locks unless specifically stated to have no locking or no outside trim.
- B. Lock Cylinders: Manufacturer's standard tumbler type, six-pin standard core.
 - 1. Provide cams and/or tailpieces as required for locking devices required.
- C. Keying: Grand master keyed.
- D. Latches: Provide a latch for every door that is not required to lock, unless specifically indicated "push/pull" or "not required to latch".

2.06 CYLINDRICAL LOCKSETS

- A. Cylindrical Locksets:

EXHIBIT "A"

- D. Hardware Supplier Personnel: Employ an Architectural Hardware Consultant (AHC) to assist in the work of this section.

1.06 PRE-INSTALLATION MEETING

- A. Convene one week prior to commencing work of this section.

1.07 DELIVERY, STORAGE, AND HANDLING

- A. Package hardware items individually; label and identify each package with door opening code to match hardware schedule.

1.08 COORDINATION

- A. Coordinate the work with other directly affected sections involving manufacture or fabrication of internal reinforcement for door hardware.
- B. Furnish templates for door and frame preparation.
- C. Sequence installation to ensure utility connections are achieved in an orderly and expeditious manner.
- D. Coordinate City of Fernandina Beach, Florida's keying requirements during the course of the Work.

1.09 WARRANTY

- A. See Section 01 78 00 - Closeout Submittals, for additional warranty requirements.
- B. Provide five year warranty for door closers and locksets.

1.10 MAINTENANCE PRODUCTS

- A. Provide special wrenches and tools applicable to each different or special hardware component.

PART 2 PRODUCTS

2.01 MANUFACTURERS - BASIS OF DESIGN

- A. Basis of Design: Yale Locks and Closers..
- B. Substitutions: See Section 01 60 00 - Product Requirements.

2.02 DOOR HARDWARE - GENERAL

- A. Provide all hardware specified or required to make doors fully functional, compliant with applicable codes, and secure to the extent indicated.
- B. Provide all items of a single type of the same model by the same manufacturer.
- C. Provide products that comply with the following:
 - 1. Applicable provisions of federal, state, and local codes.
 - 2. Fire-Rated Doors: NFPA 80.
 - 3. All Hardware on Fire-Rated Doors: Listed and classified by UL as suitable for the purpose specified and indicated.
 - 4. Hardware for Smoke and Draft Control Doors (Indicated as "S" on Drawings): Provide hardware that enables door assembly to comply with air leakage requirements of the applicable code.
 - 5. Products Requiring Electrical Connection: Listed and classified by UL as suitable for the purpose specified and indicated.
- D. Electrically Operated and/or Controlled Hardware: Provide all power supplies, power transfer hinges, relays, and interfaces required for proper operation; provide wiring between hardware and control components and to building power connection.

EXHIBIT "A"

- A. Coordinate the manufacture, fabrication, and installation of products onto which door hardware will be installed.
- B. Furnish templates for door and frame preparation to manufacturers and fabricators of products requiring internal reinforcement for door hardware.
- C. Convey City of Fernandina Beach, Florida's keying requirements to manufacturers.

1.04 SUBMITTALS

- A. See Section 01 30 00 - Administrative Requirements, for submittal procedures.
- B. Product Data: Manufacturer's catalog literature for each type of hardware, marked to clearly show products to be furnished for this project.
- C. Shop Drawings:
 - 1. Indicate locations and mounting heights of each type of hardware, schedules, catalog cuts, electrical characteristics and connection requirements.
 - 2. Submit manufacturer's parts lists and templates.
- D. Samples: Prior to preparation of hardware schedule:
 - 1. Submit 1 sample of hinge and lockset illustrating style, color, and finish.
 - 2. Samples will be returned to supplier.
- E. Hardware Schedule: Detailed listing of each item of hardware to be installed on each door. Use door numbering scheme as included in the Contract Documents. Identify electrically operated items and include power requirements.
- F. Keying Schedule: Submit for approval of City of Fernandina Beach, Florida.
- G. Manufacturer's Installation Instructions: Indicate special procedures, perimeter conditions requiring special attention, and FBC Certificates of Product Testing Approvals.
- H. Project Record Documents: Record actual locations of concealed equipment, services, and conduit.
- I. Maintenance Data: Include data on operating hardware, lubrication requirements, and inspection procedures related to preventative maintenance.
- J. Keys: Deliver with identifying tags to City of Fernandina Beach, Florida by security shipment direct from hardware supplier.
- K. Warranty: Submit manufacturer's warranty and ensure that forms have been completed in City of Fernandina Beach, Florida's name and registered with manufacturer.
- L. Maintenance Materials and Tools: Furnish the following for City of Fernandina Beach, Florida's use in maintenance of project.
 - 1. See Section 01 60 00 - Product Requirements, for additional provisions.
 - 2. Tools: One set of all special wrenches or tools applicable to each different or special hardware component, whether supplied by the hardware component manufacturer or not.

1.05 QUALITY ASSURANCE

- A. Hardware in exterior locations must have a FBC Product Approval or NOA certificate for Wind Zone 130 MPH (Vult.) as indicated on Structural Wind Diagram. High wind debris impact certification is not required.
- B. Standards for Fire-Rated Doors: Maintain one copy of each referenced standard on site, for use by Architect and Contractor.
- C. Hardware Supplier Qualifications: Company specializing in supplying commercial door hardware with 5 years of experience.

SECTION 08 71 00

DOOR HARDWARE

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Hardware for wood and hollow steel doors.
- B. Hardware for fire-rated doors.
- C. Electrically operated and controlled hardware.
- D. Lock cylinders for doors for which hardware is specified in other sections.
- E. Thresholds.
- F. Weatherstripping, seals and door gaskets.

1.02 REFERENCE STANDARDS

- A. ANSI/ICC A117.1 - American National Standard for Accessible and Usable Buildings and Facilities; International Code Council; 2009.
- B. BHMA A156.2 - American National Standard for Bored and Preassembled Locks & Latches; Builders Hardware Manufacturers Association; 2011 (ANSI/BHMA A156.2).
- C. BHMA A156.3 - American National Standard for Exit Devices; Builders Hardware Manufacturers Association; 2008 (ANSI/BHMA A156.3).
- D. BHMA A156.4 - American National Standard for Door Controls - Closers; Builders Hardware Manufacturers Association, Inc.; 2008 (ANSI/BHMA A156.4).
- E. BHMA A156.6 - American National Standard for Architectural Door Trim; Builders Hardware Manufacturers Association; 2010 (ANSI/BHMA A156.6).
- F. BHMA A156.8 - American National Standard for Door Controls - Overhead Stops and Holders; Builders Hardware Manufacturers Association, Inc.; 2010 (ANSI/BHMA A156.8).
- G. BHMA A156.13 - American National Standard for Mortise Locks & Latches; Builders Hardware Manufacturers Association; 2005 (ANSI/BHMA A156.13).
- H. BHMA A156.18 - American National Standard for Materials and Finishes; Builders Hardware Manufacturers Association, Inc.; 2006 (ANSI/BHMA A156.18).
- I. BHMA A156.22 - American National Standard for Door Gasketing and Edge Seal Systems, Builders Hardware Manufacturers Association; 2012 (ANSI/BHMA A156.22).
- J. DHI (LOCS) - Recommended Locations for Architectural Hardware for Standard Steel Doors and Frames; Door and Hardware Institute; 2004.
- K. DHI WDHS.3 - Recommended Locations for Architectural Hardware for Flush Wood Doors; Door and Hardware Institute; 1993; also in WDHS-1/WDHS-5 Series, 1996.
- L. NFPA 80 - Standard for Fire Doors and Other Opening Protectives; 2013.
- M. NFPA 101 - Code for Safety to Life from Fire in Buildings and Structures; National Fire Protection Association; 2012.
- N. UL (BMD) - Building Materials Directory; Underwriters Laboratories Inc.; current edition.

1.03 ADMINISTRATIVE REQUIREMENTS

3.06 PROTECTION

- A. Protect installed products from damage during subsequent construction.

END OF SECTION

2.01 MANUFACTURERS

- A. Carpet: See Interior Material Schedule on drawing A-605 for Design Basis Type CPT-1 and Type CPT-2.
 - 1. Interface, Inc: www.interfaceinc.com.
 - 2. J & J Industries, Inc: www.jjindustries.com.
 - 3. Milliken & Company: www.milliken.com.
 - 4. Shaw Philadelphia PC Commercial; Product Design Basis. See Material and Color Schedule for Carpet Types required.
 - 5. Substitutions: See Section 01 60 00 - Product Requirements.

2.02 CARPET

- A. Carpet to be Pattern Hot Circuit 54417, Colors to be selected, total yarn weight with 26 oz./sq. yd. Total Weight with secondary StaLok backing 62.89 oz./sq. yd. Product to meet Florida State Carpet Specification F.S.P.M.A. No. 11.9.
- B. Radiant Flux Test shall comply with Section 804.5.1, Florida Building Code.
- C. Carpet:
 - 1. Product: Broadloom Tufted Nylon Graphic Loop, 75% eco*solution Q dyed nylon manufactured by Shaw.
 - 2. Roll Width: 12 feet.
 - 3. Critical Radiant Flux: Minimum of 0.22 watts/sq cm, when tested in accordance with ASTM E648 or NFPA 253.
 - 4. Surface Flammability Ignition: Pass ASTM D2859 (the "pill test").
 - 5. Substitutions: See Section 01 60 00 - Product Requirements.

2.03 ACCESSORIES

- A. Sub-Floor Filler: Type recommended by carpet manufacturer.
- B. Vinyl or rubber edge trim and transition strips to be provided at all exposed edges of carpet. Color to be selected from manufacturers standard trim.
- C. Moldings and Edge Strips: Rubber, similar color.
- D. Adhesives: Compatible with materials being adhered.
- E. Seam Adhesive: Recommended by manufacturer.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Verify that sub-floor surfaces are dust-free and free of substances that could impair bonding of adhesives to sub floor surfaces.
- B. Verify that concrete sub-floor surfaces are ready for carpet installation by testing for moisture emission rate and alkalinity; obtain instructions if test results are not within limits recommended by carpet manufacturer and adhesive materials manufacturer.
- C. Verify that required floor-mounted utilities are in correct location.

3.02 PREPARATION

- A. Remove existing Vinyl Composition Tile or carpet in existing areas to be carpeted.
- B. Prepare floor substrates as recommended by flooring and adhesive manufacturers.
- C. Remove sub-floor ridges and bumps. Fill minor or local low spots, cracks, joints, holes, and other defects with sub-floor filler.

- D. Apply, trowel, and float filler to achieve smooth, flat, hard surface. Prohibit traffic until filler is cured.
- E. Clean substrate.

3.03 INSTALLATION - GENERAL

- A. Starting installation constitutes acceptance of sub-floor conditions.
- B. Install carpet in accordance with manufacturer's instructions and CRI Carpet Installation Standard.
- C. Verify carpet match before cutting to ensure minimal variation between dye lots.
- D. Lay out carpet and locate seams in accordance with shop drawings:
 - 1. Locate seams in area of least traffic, out of areas of pivoting traffic, and parallel to main traffic.
 - 2. Do not locate seams perpendicular through door openings.
 - 3. Align run of pile in same direction as anticipated traffic and in same direction on adjacent pieces.
 - 4. Locate change of color or pattern between rooms under door centerline.
 - 5. Provide monolithic color, pattern, and texture match within any one area.
- E. Install carpet tight and flat on subfloor, well fastened at edges, with a uniform appearance.

3.04 DIRECT-GLUED CARPET

- A. Double cut carpet seams, with accurate pattern match. Make cuts straight, true, and unfrayed. Apply seam adhesive to cut edges of woven carpet immediately.
- B. Apply contact adhesive to floor uniformly at rate recommended by manufacturer. After sufficient open time, press carpet into adhesive.
- C. Apply seam adhesive to the base of the edge glued down. Lay adjoining piece with seam straight, not overlapped or peaked, and free of gaps.
- D. Roll with appropriate roller for complete contact of adhesive to carpet backing.
- E. Trim carpet neatly at walls and around interruptions.
- F. Complete installation of edge strips, concealing exposed edges. Bind cut edges where not concealed by edge strips.

3.05 CLEANING

- A. Remove excess adhesive from floor and wall surfaces without damage.
- B. Clean and vacuum carpet surfaces.

END OF SECTION

2.01 MANUFACTURERS

- A. Carpet: See Interior Material Schedule on drawing A-605 for Design Basis Type CPT-1 and Type CPT-2..
 - 1. Interface, Inc: www.interfaceinc.com.
 - 2. J & J Industries, Inc: www.jjindustries.com.
 - 3. Milliken & Company: www.milliken.com.
 - 4. Shaw Philadelphia PC Commercial; Product Design Basis. See Material and Color Schedule for Carpet Types required.
 - 5. Substitutions: See Section 01 60 00 - Product Requirements.

2.02 CARPET

- A. Carpet to be Pattern Hot Circuit 54417, Colors to be selected, total yarn weight with 26 oz./sq. yd. Total Weight with secondary StaLok backing 62.89 oz./sq. yd. Product to meet Florida State Carpet Specification F.S.P.M.A. No. 11.9.
- B. Radiant Flux Test shall comply with Section 804.5.1, Florida Building Code.
- C. Carpet:
 - 1. Product: Broadloom Tufted Nylon Graphic Loop, 75% eco*solution Q dyed nylon manufactured by Shaw.
 - 2. Roll Width: 12 feet.
 - 3. Critical Radiant Flux: Minimum of 0.22 watts/sq cm, when tested in accordance with ASTM E648 or NFPA 253.
 - 4. Surface Flammability Ignition: Pass ASTM D2859 (the "pill test").
 - 5. Substitutions: See Section 01 60 00 - Product Requirements.

2.03 ACCESSORIES

- A. Sub-Floor Filler: Type recommended by carpet manufacturer.
- B. Vinyl or rubber edge trim and transition strips to be provided at all exposed edges of carpet. Color to be selected from manufacturers standard trim.
- C. Moldings and Edge Strips: Rubber, similar color.
- D. Adhesives: Compatible with materials being adhered.
- E. Seam Adhesive: Recommended by manufacturer.

PART 3 EXECUTION**3.01 EXAMINATION**

- A. Verify that sub-floor surfaces are dust-free and free of substances that could impair bonding of adhesives to sub floor surfaces.
- B. Verify that concrete sub-floor surfaces are ready for carpet installation by testing for moisture emission rate and alkalinity; obtain instructions if test results are not within limits recommended by carpet manufacturer and adhesive materials manufacturer.
- C. Verify that required floor-mounted utilities are in correct location.

3.02 PREPARATION

- A. Remove existing Vinyl Composition Tile or carpet in existing areas to be carpeted.
- B. Prepare floor substrates as recommended by flooring and adhesive manufacturers.
- C. Remove sub-floor ridges and bumps. Fill minor or local low spots, cracks, joints, holes, and other defects with sub-floor filler.

- D. Apply, trowel, and float filler to achieve smooth, flat, hard surface. Prohibit traffic until filler is cured.
- E. Clean substrate.

3.03 INSTALLATION - GENERAL

- A. Starting installation constitutes acceptance of sub-floor conditions.
- B. Install carpet in accordance with manufacturer's instructions and CRI Carpet Installation Standard.
- C. Verify carpet match before cutting to ensure minimal variation between dye lots.
- D. Lay out carpet and locate seams in accordance with shop drawings:
 - 1. Locate seams in area of least traffic, out of areas of pivoting traffic, and parallel to main traffic.
 - 2. Do not locate seams perpendicular through door openings.
 - 3. Align run of pile in same direction as anticipated traffic and in same direction on adjacent pieces.
 - 4. Locate change of color or pattern between rooms under door centerline.
 - 5. Provide monolithic color, pattern, and texture match within any one area.
- E. Install carpet tight and flat on subfloor, well fastened at edges, with a uniform appearance.

3.04 DIRECT-GLUED CARPET

- A. Double cut carpet seams, with accurate pattern match. Make cuts straight, true, and unfrayed. Apply seam adhesive to cut edges of woven carpet immediately.
- B. Apply contact adhesive to floor uniformly at rate recommended by manufacturer. After sufficient open time, press carpet into adhesive.
- C. Apply seam adhesive to the base of the edge glued down. Lay adjoining piece with seam straight, not overlapped or peaked, and free of gaps.
- D. Roll with appropriate roller for complete contact of adhesive to carpet backing.
- E. Trim carpet neatly at walls and around interruptions.
- F. Complete installation of edge strips, concealing exposed edges. Bind cut edges where not concealed by edge strips.

3.05 CLEANING

- A. Remove excess adhesive from floor and wall surfaces without damage.
- B. Clean and vacuum carpet surfaces.

END OF SECTION

SECTION 09 90 00

PAINTING AND COATING

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Surface preparation.
- B. Field application of paints and other coatings.
- C. Scope: Finish all new and existing to remain interior and exterior surfaces exposed to view, unless fully factory-finished and unless otherwise indicated.
 - 1. Both sides and edges of plywood backboards for electrical and telecom equipment before installing equipment.
 - 2. Exposed surfaces of steel lintels and ledge angles.
 - 3. Mechanical and Electrical:
 - a. In finished areas, paint all insulated and exposed pipes, conduit, boxes, insulated and exposed ducts, hangers, brackets, collars and supports, mechanical equipment, and electrical equipment, unless otherwise indicated.
 - b. In finished areas, paint shop-primed items.
 - c. Paint interior surfaces of air ducts that are visible through grilles and louvers with one coat of flat black paint to visible surfaces.
 - d. Paint dampers exposed behind louvers, grilles, and convactor and baseboard cabinets to match face panels.
- D. Do Not Paint or Finish the Following Items:
 - 1. Items fully factory-finished unless specifically so indicated; materials and products having factory-applied primers are not considered factory finished.
 - 2. Items indicated to receive other finishes.
 - 3. Items indicated to remain unfinished.
 - 4. Fire rating labels, equipment serial number and capacity labels, and operating parts of equipment.
 - 5. Non-metallic roofing and flashing.
 - 6. Stainless steel, anodized aluminum, bronze, terne, and lead items.
 - 7. Floors, unless specifically so indicated.
 - 8. Ceramic and other tiles.
 - 9. Brick, architectural concrete, cast stone, integrally colored plaster and stucco.
 - 10. Glass.
 - 11. Concealed pipes, ducts, and conduits.
- E. Painting materials and methods for conduit identification specified in Section 26 05 53.

1.02 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 D16 - Standard Terminology for Paint, Related Coatings, Materials, and Applications; 2012.
- C. ASTM D4442 - Standard Test Methods for Direct Moisture Content Measurement of Wood and Wood-Base Materials; 2007.
- D. GreenSeal GS-11 - Paints; 1993.
- E. SSPC (PM1) - Good Painting Practice: SSPC Painting Manual, Vol. 1; Society for Protective Coatings; Fourth Edition.

- F. USGBC LEED-NC - LEED Green Building Rating System for New Construction and Major Renovations; U.S. Green Building Council; 2009.

1.03 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, 4x4 inch in size illustrating range of colors and textures available for each surface finishing product scheduled.
- D. Certification: By manufacturer that all paints and coatings comply with VOC limits specified.
- E. Certification: By manufacturer that all paints and coatings do not contain any of the prohibited chemicals specified; GreenSeal GS-11 certification is not required but if provided shall constitute acceptable certification.
- F. FGBC Report: VOC content of all interior opaque coatings actually used.
- G. Manufacturer's Instructions: Indicate special surface preparation procedures.
- H. Maintenance Data: Submit data on cleaning, touch-up, and repair of painted and coated surfaces.
- I. Maintenance Materials: Furnish the following for City of Fernandina Beach, Florida's use in maintenance of project.
 - 1. See Section 01 60 00 - Product Requirements, for additional provisions.
 - 2. Extra Paint and Coatings: 1 gallon of each color; store where directed.
 - 3. Label each container with color in addition to the manufacturer's label.

1.04 QUALITY ASSURANCE

- A. Manufacturer Qualifications: Company specializing in manufacturing the products specified, with minimum three years documented experience.
- B. Applicator Qualifications: Company specializing in performing the type of work specified with minimum 5 years experience.

1.05 REGULATORY REQUIREMENTS

- A. Conform to applicable code for flame and smoke rating requirements for products and finishes.

1.06 MOCK-UP

- A. See Section 01 40 00 - Quality Requirements, for general requirements for mock-up.
- B. Locate where directed.
- C. Mock-up may remain as part of the work.

1.07 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.

1.08 FIELD CONDITIONS

EXHIBIT "A"

- 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 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. Provide lighting level of 80 ft candles measured mid-height at substrate surface.

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. Paints and Coatings:
 - 1. Duron, Inc: www.duron.com.
 - 2. Glidden Professional: www.gliddenprofessional.com.
 - 3. Benjamin Moore & Co: www.benjaminmoore.com.
 - 4. PPG Architectural Finishes, Inc: www.ppgaf.com.
 - 5. Sherwin-Williams Co: www.sherwin-williams.com.
- C. Substitutions: See Section 01 60 00 - Product Requirements.

2.02 PAINTS AND COATINGS - GENERAL

- A. Paints and Coatings: Ready mixed, unless intended to be a field-catalyzed coating.
 - 1. Provide paints and coatings of a soft paste consistency, capable of being readily and uniformly dispersed to a homogeneous coating, with good flow and brushing properties, and capable of drying or curing free of streaks or sags.
 - 2. Provide materials that are compatible with one another and the substrates indicated under conditions of service and application, as demonstrated by manufacturer based on testing and field experience.
 - 3. Supply each coating material in quantity required to complete entire project's work from a single production run.
 - 4. Do not reduce, thin, or dilute coatings or add materials to coatings unless such procedure is specifically described in manufacturer's product instructions.
- B. Primers: Where the manufacturer offers options on primers for a particular substrate, use primer categorized as "best" by the manufacturer.
- C. 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.
 - b. Architectural coatings VOC limits of State in which the project is located.
 - c. USGBC LEED Rating System, edition as stated in Section 013515; for interior wall and ceiling finish (all coats), anti-corrosive paints on interior ferrous metal, clear wood stains and finishes, sanding sealers, other sealers, shellac, and floor 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.
- D. Chemical Content: The following compounds are prohibited:

1. Aromatic Compounds: In excess of 1.0 percent by weight of total aromatic compounds (hydrocarbon compounds containing one or more benzene rings).
 2. Acrolein, acrylonitrile, antimony, benzene, butyl benzyl phthalate, cadmium, di (2-ethylhexyl) phthalate, di-n-butyl phthalate, di-n-octyl phthalate, 1,2-dichlorobenzene, diethyl phthalate, dimethyl phthalate, ethylbenzene, formaldehyde, hexavalent chromium, isophorone, lead, mercury, methyl ethyl ketone, methyl isobutyl ketone, methylene chloride, naphthalene, toluene (methylbenzene), 1,1,1-trichloroethane, vinyl chloride.
- E. Flammability: Comply with applicable code for surface burning characteristics.
- F. Colors: As indicated on drawings
1. Allow for minimum of three colors for each system, unless otherwise indicated, without additional cost to City of Fernandina Beach, Florida.
 2. In finished areas, finish pipes, ducts, conduit, and equipment the same color as the wall/ceiling they are mounted on/under.

2.03 PAINT SYSTEMS - EXTERIOR

- A. Paint WE-OP-3A - Wood, Opaque, Alkyd, 3 Coat:
1. One coat of alkyd primer sealer.
 2. Semi-gloss: Two coats of alkyd enamel; .
- B. Paint CE-OP-3A - Concrete/Masonry, Opaque, Alkyd, 3 Coat:
1. One coat of block filler.
 2. Flat: Two coats of alkyd enamel; .
- C. Paint ME-OP-3A - Ferrous Metals, Unprimed, Alkyd, 3 Coat:
1. One coat of alkyd primer.
 2. Semi-gloss: Two coats of alkyd enamel; .
- D. Paint ME-OP-2A - Ferrous Metals, Primed, Alkyd, 2 Coat:
1. Hand or power tool loose finish and rust to smooth surface.
 2. Primer: One coat of rust-inhibitive primer recommended by top coat manufacturer.
 3. Semi-gloss: Two coats of alkyd enamel; .
- E. Paint MgE-OP-3A - Galvanized Metals, Alkyd, 3 Coat:
1. One coat galvanize primer.
 2. Semi-gloss: Two coats of alkyd enamel; .

2.04 PAINT SYSTEMS - INTERIOR

- A. Paint WI-OP-3L - Wood, Opaque, Latex, 3 Coat:
1. One coat of latex primer sealer.
 2. Semi-gloss: Two coats of latex enamel; .
- B. Paint CI-OP-3L - Concrete/Masonry, Opaque, Latex, 3 Coat:
1. One coat of block filler.
 2. Semi-gloss: Two coats of latex enamel; .
- C. Paint MI-OP-3L - Ferrous Metals, Unprimed, Latex, 3 Coat:
1. One coat of latex primer.
 2. Semi-gloss: Two coats of latex enamel; .
- D. Paint MI-OP-2L - Ferrous Metals, Primed, Latex, 2 Coat:
1. Touch-up with latex primer.
 2. Semi-gloss: Two coats of latex enamel; .
- E. Paint Mgl-OP-3L - Galvanized Metals, Latex, 3 Coat:
1. One coat galvanize primer.
 2. Semi-gloss: Two coats of latex enamel; .

EXHIBIT "A"

- F. Paint Mal-OP-3L - Aluminum, Unprimed, Latex, 3 Coat:
 - 1. One coat etching primer.
 - 2. Semi-gloss: Two coats of latex enamel; .
- G. Paint CI-OP-3E - Typical Gypsum Board/Concrete/CMU Masonry in Toilet areas, Epoxy Enamel, 3 Coat:
 - 1. One coat of catalyzed waterborne epoxy primer.
 - 2. Gloss: Two coats of catalyzed waterborne epoxy enamel; .
- H. Paint GI-OP-3L - Gypsum Board/Plaster, Latex, 3 Coat: Walls and Ceiling areas.
 - 1. One coat of alkyd primer sealer.
 - 2. Eggshell: Two coats of latex enamel; .
- I. Paint I-TR-F - Fire-Retardant Coating, Intumescent: Provide at plywood electrical panels.
 - 1. One coat of fire-retardant primer sealer.
 - 2. Gloss: One coat of intumescent coating, flame/smoke rating of 25/50.
- J. Paint FI-OP-2A - Fabrics/Insulation Jackets, Alkyd, 2 Coat:
 - 1. One coat of alkyd primer sealer.
 - 2. Eggshell: One coat of alkyd enamel; .

2.05 ACCESSORY MATERIALS

- A. Accessory Materials: Provide all primers, sealers, cleaning agents, cleaning cloths, sanding materials, and clean-up materials required to achieve the finishes specified whether specifically indicated or not; commercial quality.
- B. Patching Material: Latex filler.
- C. Fastener Head Cover Material: Latex filler.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Verify that surfaces are ready to receive work as instructed by the product manufacturer.
- B. Examine surfaces scheduled to be finished prior to commencement of work. Report any condition that may potentially affect proper application.
- C. Test shop-applied primer for compatibility with subsequent cover materials.
- D. 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. 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.

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. Remove or mask surface appurtenances, including electrical plates, hardware, light fixture trim, escutcheons, and fittings, prior to preparing surfaces or finishing.

EXHIBIT "A"

- E. Surfaces: Correct defects and clean surfaces which affect work of this section. Remove or repair existing coatings that exhibit surface defects.
- F. Seal surfaces that might cause bleed through or staining of topcoat.
- G. Remove mildew from impervious surfaces 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. Insulated Coverings to be Painted: Remove dirt, grease, and oil from canvas and cotton.
- L. 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.
- M. Galvanized Surfaces to be Painted: Remove surface contamination and oils and wash with solvent. Apply coat of etching primer.
- N. Uncorroded 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.
- O. 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.
- P. Interior Wood Surfaces 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.
- Q. Exterior Wood Surfaces to Receive Opaque Finish: Remove dust, grit, and foreign matter. Seal knots, pitch streaks, and sappy sections. Fill nail holes with tinted exterior caulking compound after prime coat has been applied. Back prime concealed surfaces before installation.
- R. 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. Do not apply finishes to surfaces that are not dry. Allow applied coats to dry before next coat is applied.

EXHIBIT "A"

- E. Apply each coat to uniform appearance.
- F. Sand wood and metal surfaces lightly between coats to achieve required finish.
- G. Vacuum clean surfaces of loose particles. Use tack cloth to remove dust and particles just prior to applying next coat.
- H. 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. City of Fernandina Beach, Florida will provide field inspection.

3.06 CLEANING

- A. Collect waste material that could constitute a fire hazard, place in closed metal containers, and remove daily from site.

3.07 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.
 - 3. Stainless steel items.
- B. See Interior Material Legend on drawing A-605 for Design Basis Paints and Colors. See drawing A-604 for Exterior Material and Color finishes.
- 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 shop-primed items occurring in finished areas or exposed to exterior.
 - 3. Paint interior surfaces of air ducts and convactor and baseboard heating cabinets that are visible through grilles and louvers with one coat of flat black paint to visible surfaces.
 - 4. Paint dampers exposed behind louvers, grilles, to match face panels.
- D. Paint both sides and edges of plywood backboards for electrical and telephone equipment with fire resistive paint before installing equipment.

END OF SECTION

SECTION 10 14 00

SIGNAGE

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Room and door signs.
- B. Interior directional and informational signs.
- C. Cast Letters Building identification sign.

1.02 RELATED REQUIREMENTS

1.03 SUBMITTALS

- A. See Section 01 30 00 - Administrative Requirements, for submittal procedures.
- B. Product Data: Manufacturer's printed product literature for each type of sign, indicating sign styles, font, foreground and background colors, locations, overall dimensions of each sign.
- C. Signage Schedule: Provide information sufficient to completely define each sign for fabrication, including room number, room name, other text to be applied, sign and letter sizes, fonts, and colors.
 - 1. When room numbers to appear on signs differ from those on the drawings, include the drawing room number on schedule.
 - 2. When content of signs is indicated to be determined later, request such information from City of Fernandina Beach, Florida through Architect at least 2 months prior to start of fabrication; upon request, submit preliminary schedule.
 - 3. Submit for approval by City of Fernandina Beach, Florida through Architect prior to fabrication.
- D. Samples: Submit two samples of each type of sign, of size similar to that required for project, illustrating sign style, font, and method of attachment.
- E. Selection Samples: Where colors are not specified, submit two sets of color selection charts or chips.
- F. Verification Samples: Submit samples showing colors specified.
- G. Manufacturer's Installation Instructions: Include installation templates and attachment devices.

1.04 DELIVERY, STORAGE, AND HANDLING

- A. Package signs as required to prevent damage before installation.
- B. Package room and door signs in sequential order of installation, labeled by floor or building.
- C. Store tape adhesive at normal room temperature.

1.05 FIELD CONDITIONS

- A. Do not install tape adhesive when ambient temperature is lower than recommended by manufacturer.
- B. Maintain this minimum temperature during and after installation of signs.

PART 2 PRODUCTS

2.01 MANUFACTURERS

- A. Flat Signs:

EXHIBIT "A"

1. Best Sign Systems, Inc: www.bestsigns.com.
 2. Mohawk Sign Systems, Inc: www.mohawksign.com.
 3. Seton Identification Products: www.seton.com/aec.
- B. Dimensional Letter Signs:
1. Cosco Industries; Cast Aluminum: www.coscoarchitecturalsigns.com.
 2. InPro Corporation S600-060: www.inprocorp.com.

2.02 SIGNAGE APPLICATIONS

- A. Accessibility Compliance: All signs are required to comply with ADA Standards for Accessible Design and ANSI/ICC A 117.1 and applicable building codes, unless otherwise indicated; in the event of conflicting requirements, comply with the most comprehensive and specific requirements.
- B. All Signage Types: Unless otherwise indicated:
1. Character Font: Helvetica, Arial, or other sans serif font.
 2. Character Case: Upper case only.
 3. Background Color: As scheduled.
 4. Character Color: White color.
- C. Room and Door Signs: Provide a sign for every doorway, whether it has a door or not, not including corridors, lobbies, and similar open areas.
1. Sign Type: Flat signs with engraved panel media as specified.
 2. Provide "tactile" signage, with letters raised minimum 1/32 inch and Grade II braille.
 3. Use engraved panel signs as specified.
 4. Character Height: 1 inch.
 5. Sign Height: 2 inches, unless otherwise indicated.
 6. Office Doors: Identify with the room numbers shown on the drawings.
 7. Service Rooms: Identify with the room names and numbers shown on the drawings.
 8. Rest Rooms: Identify with pictograms, the names "MEN" and "WOMEN", or "BOYS" and "GIRLS", room numbers shown on the drawings, and braille.
- D. Interior Directional and Informational Signs:
1. Sign Type: Same as room and door signs.
 2. Sizes: As indicated on the drawings.
- E. Building Identification Signs:
1. Use individual metal letters.
 2. Mount on outside wall in location and size shown on drawings.

2.03 SIGN TYPES

- A. Flat Signs: Signage media without frame.
1. Edges: Square.
 2. Corners: Square.
 3. Wall Mounting of One-Sided Signs: Tape adhesive.
- B. Color and Font: Unless otherwise indicated:
1. Character Font: Helvetica, Arial, or other sans serif font.
 2. Character Case: Upper case only.
 3. Background Color: Clear.
 4. Character Color: Contrasting color.

2.04 TACTILE SIGNAGE MEDIA

- A. Engraved Panels: Laminated colored plastic; engraved through face to expose core as background color:
1. Total Thickness: 1/16 inch.

EXHIBIT "A"

2. Panel Edges: Square.
3. Panel Corners: Square.
4. Mounting: Tape adhesive.

2.05

2.06 DIMENSIONAL LETTERS

- A. Metal Letters:
1. Metal: Aluminum casting.
 2. Finish: Brushed, satin. Medium Bronze Annodized.
 3. Mounting: Concealed screws.

2.07 ACCESSORIES

- A. Concealed Screws: Stainless steel, galvanized steel, chrome plated, or other non-corroding metal. Exterior signs to have screwed backplate for sign face to be glued to.
- B. Tape Adhesive: Double sided tape, permanent adhesive at interior signage.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Verify that substrate surfaces are ready to receive work.

3.02 INSTALLATION

- A. Install in accordance with manufacturer's instructions.
- B. Install neatly, with horizontal edges level.
- C. Locate signs where indicated:
1. Room and Door Signs: Locate on wall at latch side of door with centerline of sign at 60 inches above finished floor.
 2. If no location is indicated obtain City of Fernandina Beach, Florida's instructions.
- D. Protect from damage until Substantial Completion; repair or replace damage items.

END OF SECTION

SECTION 10 21 13.19

PLASTIC TOILET COMPARTMENTS

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Solid plastic toilet compartments.

1.02 REFERENCE STANDARDS

1.03 SUBMITTALS

- A. See Section 01 30 00 - Administrative Requirements, for submittal procedures.
- B. Shop Drawings: Indicate partition plan, elevation views, dimensions, details of wall supports, door swings.
- C. Product Data: Provide data on panel construction, hardware, and accessories.
- D. Samples: Submit two samples of partition panels, 4x4 inch in size illustrating panel finish, color, and sheen.
- E. Manufacturer's Installation Instructions: Indicate special procedures.

PART 2 PRODUCTS

2.01 MANUFACTURERS

- A. Plastic Toilet Compartments:
 1. Ampco Products, Inc: www.ampco.com.
 2. Metpar Corp: www.metpar.com.
 3. Scranton Products (Santana/Comtec/Capital): www.scrantonproducts.com.
 4. Substitutions: Section 01 60 00 - Product Requirements.

2.02 COMPONENTS

- A. Toilet Compartments: Solid molded plastic panels, doors, and pilasters, floor-mounted headrail-braced.
 1. Color: See Interior Material and Color Legend on drawing A-605.
- B. Door and Panel Dimensions:
 1. Thickness: 1 inch.
 2. Door Width: 24 inch.
 3. Door Width for Handicapped Use: 36 inch, out-swinging.
 4. Height: 58 inch.
 5. Thickness of Pilasters: 1 inch.

2.03 ACCESSORIES

- A. Pilaster Shoes: Formed chromed steel with satin finish, 3 in high, concealing floor fastenings.
 1. Provide adjustment for floor variations with screw jack through steel saddles integral with pilaster.
- B. Head Rails: Hollow chrome plated steel tube, 1 x 1-5/8 inch size, with anti-grip strips and cast socket wall brackets.
- C. Pilaster Brackets: Satin stainless steel.
- D. Wall Brackets: Continuous type, satin stainless steel.
- E. Attachments, Screws, and Bolts: Stainless steel, tamper proof type.

1. For attaching panels and pilasters to brackets: Through-bolts and nuts; tamper proof.
- F. Hardware: Satin stainless steel:
1. Pivot hinges, gravity type, adjustable for door close positioning; two per door.
 2. Nylon bearings.
 3. Door Latch: Slide type with exterior emergency access feature.
 4. Door strike and keeper with rubber bumper; mounted on pilaster in alignment with door latch.
 5. Coat hook with rubber bumper; one per compartment, mounted on door.
 6. Provide door pull for outswinging doors.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Verify that field measurements are as indicated.
- B. Verify correct spacing of and between plumbing fixtures.
- C. Verify correct location of built-in framing, anchorage, and bracing.

3.02 INSTALLATION

- A. Install partitions secure, rigid, plumb, and level in accordance with manufacturer's instructions.
- B. Maintain 3/8 to 1/2 inch space between wall and panels and between wall and end pilasters.
- C. Attach panel brackets securely to walls using anchor devices.
- D. Attach panels and pilasters to brackets. Locate head rail joints at pilaster center lines.
- E. Field touch-up of scratches or damaged finish will not be permitted. Replace damaged or scratched materials with new materials.

3.03 TOLERANCES

- A. Maximum Variation From True Position: 1/4 inch.
- B. Maximum Variation From Plumb: 1/8 inch.

3.04 ADJUSTING

- A. Adjust and align hardware to uniform clearance at vertical edge of doors, not exceeding 3/16 inch.
- B. Adjust hinges to position doors in partial opening position when unlatched. Return out-swinging doors to closed position.
- C. Adjust adjacent components for consistency of line or plane.

END OF SECTION

SECTION 10 26 01

WALL AND CORNER GUARDS

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Corner guards.

1.02 REFERENCE STANDARDS

- A. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials; 2012.

1.03 SUBMITTALS

- A. See Section 01 30 00 - Administrative Requirements, for submittal procedures.
- B. Product Data: Indicate physical dimensions, features, anchorage details, and rough-in measurements.
- C. Manufacturer's Instructions: Indicate special procedures, perimeter conditions requiring special attention, and color and finish samples.

PART 2 PRODUCTS

2.01 MANUFACTURERS

- A. Wall and Corner Guards:
 - 1. Arden Architectural Specialties, Inc: www.ardenarch.com.
 - 2. Construction Specialties, Inc: www.c-sgroup.com.
 - 3. InPro Corporation: www.inprocorp.com.
 - 4. Substitutions: See Section 01 60 00 - Product Requirements.

2.02 COMPONENTS

- A. Corner Guards - Surface Mounted: High impact vinyl with extruded aluminum full height retainer and integral impact absorbing device.
 - 1. Performance: Resist lateral impact force of 100 lbs at any point without damage or permanent set.
 - 2. Surface Burning Characteristics: Provide assemblies with flame spread index of 25 or less and smoke developed index of 450 or less, when tested in accordance with ASTM E84.
 - 3. Size: 2 inches.
 - 4. Corner: Square.
 - 5. Color: As selected from manufacturer's standard colors.
 - 6. Length: One piece.
 - 7. Preformed end caps.

2.03 FABRICATION

- A. Fabricate components with tight joints, corners and seams.
- B. Pre-drill holes for attachment.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Verify that rough openings, concealed blocking, and anchors are correctly sized and located.

3.02 INSTALLATION

EXHIBIT "A"

- A. Install components in accordance with manufacturer's instructions, level and plumb, secured rigidly in position to wall framing members only.
- B. Position corner guard 4 inches above finished floor to 5'-4" inches high.

3.03 TOLERANCES

- A. Maximum Variation From Required Height: 1/4 inch.
- B. Maximum Variation From Level or Plane For Visible Length: 1/4 inch.

END OF SECTION

SECTION 10 28 00

TOILET, BATH, AND LAUNDRY ACCESSORIES

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Accessories for toilet rooms and utility rooms.
- B. Grab bars.

1.02 REFERENCE STANDARDS

- A. ASTM A123/A123M - Standard Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products; 2012.
- B. ASTM A269 - Standard Specification for Seamless and Welded Austenitic Stainless Steel Tubing for General Service; 2010.
- C. ASTM A653/A653M - Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process; 2011.
- D. ASTM A666 - Standard Specification for Annealed or Cold-Worked Austenitic Stainless Steel Sheet, Strip, Plate, and Flat Bar; 2010.
- E. ASTM B456 - Standard Specification for Electrodeposited Coatings of Copper Plus Nickel Plus Chromium and Nickel Plus Chromium; 2011e1.
- F. ASTM C1036 - Standard Specification for Flat Glass; 2011e1.
- G. ASTM C1503 - Standard Specification for Silvered Flat Glass Mirror; 2008.
- H. ASTM F2285 - Standard Consumer Safety Performance Specification for Diaper Changing Tables for Commercial Use; 2004 (Reapproved 2010).
- I. GSA CID A-A-3002 - Mirrors, Glass; U.S. General Services Administration; 1996.

1.03 SUBMITTALS

- A. See Section 01 30 00 - Administrative Requirements, for submittal procedures.
- B. Product Data: Provide data on accessories describing size, finish, details of function, attachment methods.
- C. Manufacturer's Installation Instructions: Indicate special procedures and conditions requiring special attention.

1.04 COORDINATION

- A. Coordinate the work with the placement of internal wall reinforcement, concealed ceiling supports, and reinforcement of toilet partitions to receive anchor attachments.

PART 2 PRODUCTS

2.01 MANUFACTURERS

- A. Toilet Accessories:
 - 1. American Specialties, Inc: www.americanspecialties.com.
 - 2. Bobrick Washroom Equipment, Inc: www.bobrick.com.
 - 3. Bradley Corporation: www.bradleycorp.com.
 - 4. Substitutions: Section 01 60 00 - Product Requirements.
- B. All items of each type to be made by the same manufacturer.

2.02 MATERIALS

- A. Accessories - General: Shop assembled, free of dents and scratches and packaged complete with anchors and fittings, steel anchor plates, adapters, and anchor components for installation.
 - 1. Grind welded joints smooth.
 - 2. Fabricate units made of metal sheet or seamless sheets, with flat surfaces.
- B. Keys: Provide 4 keys for each accessory to City of Fernandina Beach, Florida; master key all lockable accessories.
- C. Stainless Steel Sheet: ASTM A666, Type 304.
- D. Stainless Steel Tubing: ASTM A269, Type 304 or 316.
- E. Galvanized Sheet Steel: Hot-dipped galvanized steel sheet, ASTM A653/A653M, with G90/Z275 coating.
- F. Mirror Glass: Tempered Float glass, ASTM C 1036 Type I, Class 1, Quality Q2, with silvering, copper coating, and suitable protective organic coating to copper backing in accordance with GSA CID A-A-3002.
- G. Adhesive: Two component epoxy type, waterproof.
- H. Fasteners, Screws, and Bolts: Hot dip galvanized, tamper-proof, security type.
- I. Expansion Shields: Fiber, lead, or rubber as recommended by accessory manufacturer for component and substrate.

2.03 FINISHES

- A. Stainless Steel: No. 4 satin brushed finish, unless otherwise noted.
- B. Chrome/Nickel Plating: ASTM B456, SC 2, satin finish, unless otherwise noted.
- C. Baked Enamel: Pretreat to clean condition, apply one coat primer and minimum two coats epoxy baked enamel.
- D. Galvanizing for Items Other than Sheet: Comply with ASTM A123/A123M; galvanize ferrous metal and fastening devices.

2.04 TOILET ROOM ACCESSORIES

- A. Toilet Tissue Dispenser: Type TTD - Double roll, surface mounted bracket type, stainless steel.
 - 1. Product: Model 20030 manufactured by ASI.
- B. Paper Towel Dispenser: Type PTD - Folded paper type, stainless steel, semi-recessed, with viewing slots on sides as refill indicator and tumbler lock.
 - 1. Capacity: 400 Single-Fold minimum.
 - 2. Product: 20210 manufactured by ASI.
- C. Combination Towel Dispenser/Waste Receptacle: Type TPDWR - Recessed with projecting waste receptacle, stainless steel; seamless wall flanges, continuous piano hinges, tumbler locks on upper and lower doors.
 - 1. Waste receptacle liner: Reusable, heavy-duty vinyl.
 - 2. Towel dispenser capacity: 600 single-fold.
 - 3. Waste receptacle capacity: 14 gallons.
 - 4. Product: Model 20469 manufactured by ASI.
- D. Soap Dispenser: Type SD - Liquid soap dispenser, wall-mounted, surface, with stainless steel cover and horizontal stainless steel tank and working parts; push type soap valve, check valve, and window gage refill indicator, tumbler lock.
 - 1. Minimum Capacity: 48 ounces.

2. Product: 9343 manufactured by ASI.
- E. Mirrors: Type M-1, M-2 - Stainless steel framed, 6 mm thick tempered glass mirror.
1. Size: Sizes as indicated on drawings. Model 0600 manufactured by ASI.
 2. Frame: 0.05 inch angle shapes, with mitered and welded and ground corners, and tamperproof hanging system; No.4 finish.
 3. Backing: Full-mirror sized, minimum 0.03 inch galvanized steel sheet and nonabsorptive filler material.
- F. Seat Cover Dispenser: Type SCD - Stainless steel, surface-mounted, reloading by concealed opening at base, tumbler lock.
1. Minimum capacity: 250 seat covers, each side.
 2. Product: Model 20477-SM manufactured by ASI.
- G. Grab Bars: Type GB-1, GB-2 - Stainless steel, 1-1/4 inches outside diameter, minimum 0.05 inch wall thickness, nonslip grasping surface finish, concealed flange mounting; 1-1/2 inches clearance between wall and inside of grab bar.
1. Length and configuration: As indicated on drawings.
 2. Product: Model Grabbar Configuration as indicated on drawings manufactured by ASI.
- H. Sanitary Napkin Disposal Unit: Type SND - Stainless steel, surface-mounted, self-closing door, locking bottom panel with full-length stainless steel piano-type hinge, removable receptacle.
1. Product: Model 20852 manufactured by ASI.
- I. Robe Hook: Type RH - Heavy-duty stainless steel, single-prong, rectangular-shaped bracket and backplate for concealed attachment, satin finish.
1. Product: Model 7345 manufactured by ASI.
- J. Diaper Changing Station: Type BCT - Wall-mounted folding diaper changing station for use in commercial toilet facilities, meeting or exceeding ASTM F2285.
1. Style: Horizontal.
 2. Material: Polyethylene.
 3. Mounting: Surface.
 4. Color: Gray.
 5. Minimum Rated Load: 250 lbs.
 6. Manufacturers:
 - a. American Specialties, Inc Model 9012: www.americanspecialties.com.
 - b. Bradley Corporation: www.bradleycorp.com.
 - c. Koala Kare Products: www.koalabear.com.
 - d. Substitutions: See Section 01600 - Product Requirements.

2.05 UTILITY ROOM ACCESSORIES

- A. Combination Utility Shelf/Mop and Broom Holder: Type MRS - 0.05 inch thick stainless steel, Type 304, with 1/2 inch returned edges, 0.06 inch steel wall brackets.
1. Drying rod: Stainless steel, 1/4 inch diameter.
 2. Hooks: 2, 0.06 inch stainless steel rag hooks at shelf front.
 3. Mop/broom holders: 3 spring-loaded rubber cam holders at shelf front.
 4. Length: 30 inches.
 5. Product: Model 1315 manufactured by ASI.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Verify existing conditions before starting work.
- B. Verify exact location of accessories for installation.

- C. Verify that field measurements are as indicated on drawings.

3.02 PREPARATION

- A. Deliver inserts and rough-in frames to site for timely installation.
- B. Provide templates and rough-in measurements as required.

3.03 INSTALLATION

- A. Install accessories in accordance with manufacturers' instructions.
- B. Install plumb and level, securely and rigidly anchored to substrate.
- C. Mounting Heights and Locations: As required by accessibility regulations and as indicated on drawings

END OF SECTION

SECTION 10 44 00

FIRE PROTECTION SPECIALTIES

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Fire extinguisher cabinets.
- B. Accessories.

1.02 REFERENCE STANDARDS

- A. NFPA 10 - Standard for Portable Fire Extinguishers; 2010.

1.03 PERFORMANCE REQUIREMENTS

- A. Conform to NFPA 10.
- B. Fire Extinguishers will be provided and installed by owner.

1.04 SUBMITTALS

- A. See Section 01 30 00 - Administrative Requirements, for submittal procedures.
- B. Shop Drawings: Indicate cabinet physical dimensions.
- C. Manufacturer's Installation Instructions: Indicate special criteria and wall opening coordination requirements.
- D. Manufacturer's Certificate: Certify that products meet or exceed specified requirements.
- E. Maintenance Data: Include test, refill or recharge schedules and re-certification requirements.

PART 2 PRODUCTS

2.01 MANUFACTURERS

- A. Fire Extinguisher Cabinets and Accessories:
 - 1. JL Industries, Inc: www.jlindustries.com.
 - 2. Larsen's Manufacturing Co: www.larsensmfg.com.
 - 3. Potter-Roemer: www.potterroemer.com.
 - 4. Substitutions: See Section 01 60 00 - Product Requirements.

2.02 FIRE EXTINGUISHERS

- A. Fire Extinguishers - General: Comply with product requirements of NFPA 10 and applicable codes, whichever is more stringent.
- B. Dry Chemical Multi-Purpose Type Fire Extinguishers: (Owner will provide and install) Stainless steel tank, with pressure gage.
 - 1. Class A:B:C.
 - 2. Size MP10.
 - 3. Size and classification as scheduled.

2.03 FIRE EXTINGUISHER CABINETS

- A. Metal: Formed primed steel sheet; 0.036 inch thick base metal.
- B. Cabinet Configuration: Semi-recessed type.
 - 1. Sized to accommodate accessories.
 - 2. Trim: Returned to wall surface, with 2 1/2 inch projection, 2 inch wide face.
 - 3. Form cabinet enclosure with right angle inside corners and seams. Form perimeter trim

and door stiles.

- C. Door: 0.036 inch thick, reinforced for flatness and rigidity; latch. Hinge doors for 180 degree opening with two butt hinge. Provide nylon catch.
- D. Door Glazing: Plastic, clear, 1/8 inch thick acrylic. Set in resilient channel gasket glazing.
- E. Cabinet Mounting Hardware: Appropriate to cabinet. Pre-drill for anchors.
- F. Weld, fill, and grind components smooth.
- G. Finish of Cabinet Exterior Trim and Door: Baked enamel, color as selected.
- H. Finish of Cabinet Interior: White enamel.

2.04 ACCESSORIES

- A. Extinguisher Brackets: NIC - Owner will provide and install. chrome-plated
- B. Cabinet Signage: Fire Extinguisher (on cabinet door).

PART 3 EXECUTION

3.01 EXAMINATION

- A. Verify rough openings for cabinet are correctly sized and located.

3.02 INSTALLATION

- A. Install in accordance with manufacturer's instructions.
- B. Install cabinets plumb and level in wall openings, 24 inches from finished floor to inside bottom of cabinet.
- C. Secure rigidly in place.

END OF SECTION

SECTION 12 21 13

HORIZONTAL LOUVER BLINDS

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Horizontal slat louver blinds to be provided for all exterior windows.
- B. Provide Horizontal slat louver blinds at all interior view windows.
- C. Operating hardware.

1.02 SUBMITTALS

- A. See Section 01 30 00 - Administrative Requirements, for submittal procedures.
- B. Product Data: Provide data indicating physical and dimensional characteristics.
- C. Samples: Submit two samples, 2 inch long illustrating slat materials and finish, color, cord type and color.

1.03 PROJECT CONDITIONS

- A. Coordinate the work with window installation and placement of concealed blocking to support blinds.
- B. Take field measurements to determine sizes required.

PART 2 PRODUCTS

2.01 MANUFACTURERS

- A. Horizontal Louver Blinds:
 - 1. Hunter Douglas: www.hunterdouglas.com.
 - 2. Levolor Contract: www.levolorcontract.com.
 - 3. Graber, division of Springs Window Fashions: www.graberblinds.com.
 - 4. Substitutions: See Section 01 60 00 - Product Requirements.

2.02 BLINDS AND BLIND COMPONENTS

- A. Blinds: Horizontal slat louvers hung from full-width headrail with full-width bottom rail; manual control of raising and lowering by cord with full range locking; blade angle adjustable by control wand; complying with WCMA A100.1.
- B. Metal Slats: Spring tempered pre-finished aluminum; radiused slat corners, with manufacturing burrs removed.
 - 1. Width: 1 inch.
 - 2. Thickness: 0.008 inch.
 - 3. Color: Satin Aluminum finish.
- C. Slat Support: Woven polypropylene cord, ladder configuration.
- D. Head Rail: Pre-finished, formed aluminum box, with end caps; internally fitted with hardware, pulleys, and bearings for operation; same depth as width of slats
 - 1. Color: Same as slats.
- E. Bottom Rail: Pre-finished, formed steel with top side shaped to match slat curvature; with end caps. Color: Same as headrail.
- F. Lift Cord: Braided nylon; continuous loop.
 - 1. Color: As selected.

- G. Control Wand: Extruded hollow plastic; hexagonal shape.
 - 1. Non-removable type.
 - 2. Length of window opening height less 3 inches.
 - 3. Color: clear .
- H. Headrail Attachment: Wall brackets.
- I. Accessory Hardware: Type recommended by blind manufacturer.

2.03 FABRICATION

- A. Fabricate blinds to fit within openings with uniform edge clearance of 1/4 inch.
- B. At openings with multiple windows, provide single blind assemblies for each three windows.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Verify that openings are ready to receive the work.
- B. Ensure structural blocking and supports are correctly placed.

3.02 INSTALLATION

- A. Install blinds in accordance with manufacturer's instructions.
- B. Secure in place with flush countersunk fasteners.
- C. Place intermediate head supports at 36 inch on center.

3.03 INSTALLATION TOLERANCES

- A. Maximum Variation of Gap at Window Opening Perimeter: 1/4 inch.
- B. Maximum Offset From Level: 1/8 inch.

3.04 ADJUSTING

- A. Adjust blinds for smooth operation.

3.05 CLEANING

- A. Clean blind surfaces just prior to occupancy.

END OF SECTION

SECTION 12 36 00

COUNTERTOPS

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Countertops for architectural cabinetwork.
- B. Window Stools.

1.02 REFERENCE STANDARDS

- A. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials; 2012.
- B. ISSFA-2 - Classification and Standards for Solid Surfacing Material; International Solid Surface Fabricators Association; 2001 (2007).
- C. NEMA LD 3 - High-Pressure Decorative Laminates; 2005.
- D. PS 1 - Structural Plywood; 2009.

1.03 SUBMITTALS

- A. See Section 01 30 00 - Administrative Requirements, for submittal procedures.
- B. Product Data: Manufacturer's data sheets on each product to be used, including:
 - 1. Preparation instructions and recommendations.
 - 2. Storage and handling requirements and recommendations.
 - 3. Specimen warranty.
- C. Shop Drawings: Complete details of materials and installation; combine with shop drawings of cabinets and casework specified in other sections.
- D. Selection Samples: For each finish product specified, color chips representing manufacturer's full range of available colors and patterns.
- E. Test Reports: Chemical resistance testing, showing compliance with specified requirements.
- F. Maintenance Data: Manufacturer's instructions and recommendations for maintenance and repair of countertop surfaces.

1.04 DELIVERY, STORAGE, AND HANDLING

- A. Store products in manufacturer's unopened packaging until ready for installation.
- B. Store and dispose of solvent-based materials, and materials used with solvent-based materials, in accordance with requirements of local authorities having jurisdiction.

PART 2 PRODUCTS

2.01 COUNTERTOP ASSEMBLIES

- A. Solid Surfacing Countertops: Solid surfacing sheet or plastic resin casting over continuous substrate.
 - 1. Flat Sheet Thickness: 1/4 inch, minimum.
 - 2. Solid Surfacing Sheet and Plastic Resin Castings: Complying with ISSFA-2 and NEMA LD 3; acrylic or polyester resin, mineral filler, and pigments; homogenous, non-porous and capable of being worked and repaired using standard woodworking tools; no surface coating; color and pattern consistent throughout thickness.
 - a. Surface Burning Characteristics: Flame spread 25, maximum; smoke developed 450,

- maximum; when tested in accordance with ASTM E84.
- b. Finish on Exposed Surfaces: Matte, gloss rating of 5 to 20.
- c. Color/Pattern Family: Medium-grained "salt-and-pepper" look, low contrast.
- d. Manufacturers:
 - 1) Dupont: www.corian.com.
 - 2) Formica Corporation: www.formica.com.
 - 3) Avonite Surfaces: www.avonitesurfaces.com.
 - 4) Wilsonart International, Inc: www.wilsonart.com.
 - 5) Substitutions: See Section 01 60 00 - Product Requirements.
- 3. Other Components Thickness: 1/2 inch, minimum.
- 4. Back and End Splashes: Same sheet material, square top; minimum 4 inches high.
- 5. Window Stools: Sizes as indicated on drawings.

2.02 ACCESSORY MATERIALS

- A. Plywood for Supporting Substrate: PS 1 Exterior Grade, A-C veneer grade, minimum 5-ply; minimum 3/4 inch thick; join lengths using metal splines.
- B. Adhesives: Chemical resistant waterproof adhesive as recommended by manufacturer of materials being joined.
- C. Cove Molding for Top of Splashes: Rubber with semi-gloss finish and T-spline to fit between splash and wall; 1/2 inch by 1/2 inch.
- D. Cove Molding for Top of Splashes: Rubber with semi-gloss finish and T-spline to fit between splash and wall; 1/2 inch by 1/2 inch; color as selected.
- E. Joint Sealant: Mildew-resistant silicone sealant, clear.

2.03 FABRICATION

- A. Fabricate tops and splashes in the largest sections practicable, with top surface of joints flush.
 - 1. Join lengths of tops using best method recommended by manufacturer.
 - 2. Fabricate to overhang fronts and ends of cabinets 1 inch except where top butts against cabinet or wall.
 - 3. Prepare all cutouts accurately to size; replace tops having improperly dimensioned or unnecessary cutouts or fixture holes.
- B. Provide back/end splash wherever counter edge abuts vertical surface unless otherwise indicated.
 - 1. Secure to countertop with concealed fasteners and with contact surfaces set in waterproof glue.
 - 2. Height: 4 inches, unless otherwise indicated.
- C. Solid Surfacing: Fabricate tops up to 144 inches long in one piece; join pieces with adhesive sealant in accordance with manufacturer's recommendations and instructions.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Do not begin installation until substrates have been properly prepared.
- B. If substrate preparation is the responsibility of another installer, notify Architect of unsatisfactory preparation before proceeding.
- C. Verify that wall surfaces have been finished and mechanical and electrical services and outlets are installed in proper locations.

3.02 PREPARATION

EXHIBIT "A"

- A. Clean surfaces thoroughly prior to installation.
- B. Prepare surfaces using the methods recommended by the manufacturer for achieving the best result for the substrate under the project conditions.

3.03 INSTALLATION

- A. Securely attach countertops to cabinets using concealed fasteners. Make flat surfaces level; shim where required.
- B. Seal joint between back/end splashes and vertical surfaces.
 - 1. Where indicated use rubber cove molding.
 - 2. Where applied cove molding is not indicated use specified sealant.

3.04 CLEANING

3.05 PROTECTION

- A. Protect installed products until completion of project.
- B. Touch-up, repair or replace damaged products before Substantial Completion.

END OF SECTION

SECTION 22 30 00

PLUMBING

PART 1 - GENERAL

1.1 DESCRIPTION

- A. The work includes the providing of all labor, materials and services necessary to install the indicated systems, complete with hangers, supports, equipment, and connections required to any fixture or equipment indicated or specified.
- B. The work includes, but is not limited to the following:
 - 1. Sanitary waste and vent piping systems.
 - 2. Domestic hot and cold water piping systems.
 - 3. Water Heaters.

1.2 ALL WORK

- A. Shall be performed by mechanics skilled in the particular class of work and all equipment shall be installed in strict accordance with the manufacturer's recommendations. The work shall be coordinated with other trades and responsibilities established so that the work shall be completed without delays or interference with schedules.

1.3 CUTTING AND PATCHING

- A. Where required, the Contractor shall do the cutting and patching using workmen who are skilled in the trade involved. The completed work shall present a finished workmanlike appearance.

1.4 PIPING AND DRAWINGS

- A. The drawings are diagrammatic and not intended to show in detail all features of the work. The location of all piping shall be coordinated to determine that it clears all openings and structural members, that piping indicated as concealed can be properly concealed in walls or partitions of finished rooms, and that it does not interfere with lights, ductwork, or equipment having fixed locations. Conceal all piping except where otherwise indicated.

1.5 OPENINGS IN EXISTING CONCRETE CONSTRUCTION

- A. Shall be core drilled or cut with masonry saw. Pneumatic tools will not be permitted. The integrity of the fire rating of walls, ceilings and floors shall be maintained and shall meet Life Safety and local codes.

1.6 ELECTRICAL WORK

- A. In accordance with Division 16. Refer to electrical drawings for electrical characteristics of equipment.

1.7 TRAPS

- A. Each fixture, equipment drain or floor drain shall be separately trapped, unless otherwise indicated or specified.

1.8 UNIONS

- A. Install on each side of each valve and connection to equipment.

1.9 ESCUTCHEON PLATES

- A. For all piping through walls, floors and ceilings exposed to view. Chromium plated, two piece, hinged, with set screws. To fit around insulation, where present. Deep escutcheon plates shall be provided where pipe sleeves extend above floors.

1.10 SHOP DRAWINGS

- A. Seven (7) copies of Shop drawings of each item listed in the "Equipment Schedules" or elsewhere on the drawings and in the specifications. (These shop drawings shall be submitted to the Architect and approved by him before the Contractor may purchase the equipment or materials.) Two sets will be retained for the Architect.
- B. Shop drawings shall be submitted with all equipment items complete at one time. Shop drawings shall be presented in book form in a hardbacked binder with heavy paper dividers for each paragraph of the specification delineating an item or items of equipment. Dividers shall be provided with substantial staggered index tabs, with each tab numbered with the specification paragraph number for the included item(s) of equipment. In addition, an index listing each tab division with equipment covered shall be provided at the front of the submittal book. Provide a single tab labeled "DWGS" for items of equipment that might be specified on the Drawings. Items presented singly for approval will not be acceptable. **All shop drawings shall be presented as hard copies; no electronic submittals will be accepted.**
- C. Coordinate the location of floor drains, piping and other pertinent items with the work of other trades. Installation of these items shall be made after receipt of and in accordance with the approved shop drawings.

1.11 UNIONS AND FLANGES

- A. Unions and flanges may not, in every case, be shown on the Drawings, but are to be provided where necessary and adjacent to all equipment installed or provided for under this Contract.

1.12 GUARANTEE

- A. All equipment, material, accessories and installation shall carry a guarantee against defects for a period of one year from the date of acceptance. Each system as a whole, and in all its parts, shall be guaranteed to function correctly up to the specified capacity. Should a system, or any part thereof, fail to meet the performance requirements, necessary replacements, alterations or repairs shall be made to bring performance up to specified requirements. Building construction finishes damaged or marred shall be restored to the satisfaction of the Owner's representative. All of the above described shall be done without cost to the Owner.

PART 2 - PRODUCTS

2.1 GENERAL

- A. All materials shall be new and free from all defects. These specifications list all of the acceptable materials for a given service, one of which shall be used unless otherwise specifically noted in the specifications or on the Drawings.
- B. The quality and weight of materials furnished and installed shall comply with the requirements and specifications of the appropriate standards of the American Society for Testing and Materials, Life

Safety Code and the local plumbing code.

2.2 PIPE AND FITTINGS

- A. General: All piping shall be run straight, plumb and properly graded in direction indicated on the Drawings. Cut pipe shall be squarely cut and properly reamed to remove all cuttings and burrs before making up the joints. Fittings and nipples shall be of the same materials as the pipe. In cases where it is necessary to join copper piping to steel equipment or steel piping, install an insulating fitting equal to EPCO dielectric pipe fittings as manufactured by Epco Sales, Inc., 3204 Sackett Avenue, Cleveland, Ohio.
- B. Plastic Pipe and Fittings: Pipe shall be Schedule 40 PVC conforming to ASTM D1785. Fittings shall be PVC conforming to ASTM D 2466. Solvent cement shall conform to ASTM D 2564.
- C. (CPVC) - Chlorinated Polyvinyl Chloride Pipe - ASTM F 441, shall meet requirements of the NSF Standard 14. Fitting: ASTM F 439, solvent cement socket type.

2.3 VALVES

- A. General: Crane valve numbers are specified to establish type and quality. Equivalent valve types by Fairbanks, Hammond or Powell will be considered for approval.
- B. Domestic Water Piping:
 1. Gate Valves: 2" and smaller - Crane No. 428 or No. 438 as applicable. 2-1/2" or IPS or larger - Crane #465-1/2 or #461 as applicable.
 2. Check Valves: 2" IPS or smaller - Crane #37. 2-1/2" IPS or larger - Crane 373.
 3. Hose Bibb: Chicago Faucets #387 with Watts No. 8A backflow preventer, Key operated handles.
 4. Ball Valves: Full port ball valves with stainless steel stem and ball with teflon seat and rings.
 5. Exterior isolation valves 2 inches and larger: Cast-iron resilient wedge valve. Wedge shall be to totally encapsulated with rubber, non-rising stem with bonnet and o-ring plate fusion-bond epoxy coated.

2.4 FLOOR DRAINS

- A. Floor Drains: See Drawings for specifications. Floor drains shall be installed in accordance with manufacturer's recommendations.

2.5 CLEANOUTS

- A. Where indicated and at the base of all risers. Additional cleanouts at the Contractor's option for the convenience of testing and erection. Cleanouts installed in floors with waterproof membrane shall be provided with clamping rings. Install cleanout frames and covers to be flush with the adjoining architectural finishing material. Clean-outs located outside of the building shall be two-way type. Josam Model Numbers are indicated below. Comparable Model Numbers by Wade or J. R. Smith will be considered for approval.
- B. Cleanout Plugs: Josam 58540-20.
- C. Cleanouts in Wall: Josam 58790-22.
- D. Cleanouts in Concrete and Terrazzo Floor Finishes: Josam 58410.
- E. Cleanouts in Vinyl Tile Floor Finishes: Josam 56004-2-15.

F. Carpeted Floor Finishes: Josam 58410-14.

2.6 PIPE HANGERS

A. Hangers shall be of the clevis type, MSS SP-58, type 1.

2.7 DOMESTIC WATER HEATERS

A. As specified on the Drawings and install as per manufacturer's recommendations.

2.8 WATER HAMMER ARRESTORS

A. In conformance with Plumbing and Drainage Institute No. PDI-WH-201. Sizes as indicated on the Drawings.

2.9 PLUMBING FIXTURES

A. General: All plumbing fixtures shall be "First Quality". All enameled iron fixtures shall have acid resisting white enamel. All fixtures and fittings proposed shall be from one manufacturer and of similar character. Escutcheons, handles, etc., on the different fixtures shall be of the same design. All fixtures and fittings proposed shall be submitted for approval with catalog cuts and full description. All exposed metal and piping not otherwise specified shall be polished chromium on brass or bronze. All hot and cold water supply to fixtures shall be provided with stops of the loose key type.

B. See Drawings for fixture specifications. Where fixture types refer to those manufactured by Kohler, unless otherwise noted, these numbers are used to indicate type and quality of fixtures desired. Fixtures of equal quality manufactured by American Standard, Briggs or Eljer will be considered for approval. Hanger supports and carriers shall be installed in accordance with manufacturers recommendations. All wall-hung fixtures located on a stud wall or chased wall shall be provided with floor carriers. Wall-hung fixtures located on a CMU block wall shall be provided with a heavy-duty anchoring plate.

2.10 EQUIPMENT FURNISHED BY OTHER SECTIONS

A. Certain items of equipment will be furnished as work of other sections and shall be furnished with necessary plumbing services as work of this section, responsibility includes determining the correct roughing location for services and making final connections.

B. Piping and Valves necessary to supplement those items which are furnished by other sections shall be furnished and installed by this section. Provide shut-off valves on all supply branches to equipment. All piping and valves in finished room normally exposed to view shall be brass, chromium plated, and provided with chromium plated escutcheon plates.

2.11 THERMAL INSULATION

A. General: No insulation shall be installed until the piping systems have been checked and found free of all leaks. Surfaces shall be clean and dry before attempting to apply insulation. Insulation shall be installed by a professional insulation contractor with adequate experience and ability to perform the work. The Contractor shall verify that all materials comply with the specifications.

B. Domestic Hot Water Piping:

1. Material: Shall be insulated with one-inch thick "Imcolock" or "Arctictherm" polyethylene pipe insulation.
2. Application: Pipe insulation shall be secured in place by applying pressure to the pressure sensitive closure system. Elbows and tees shall be insulated with miter-cut

EXHIBIT "A"

fittings. Valves and other irregular fittings shall be insulated per manufacturer's installation guidelines.

- C. Domestic Cold Water and Horizontal Storm Water Piping:
 - 1. Material: Shall be the same material and applied in the same manner as specified above for domestic hot water piping, except the insulation thickness shall be 1/2 inch.
- D. Waste lines from electric water coolers and waste piping exposed, piping in crawl space or in exterior walls shall be insulated with 3/8 inch thick "Imcolock" or "Arctictherm".
- E. Exposed water piping and P-traps serving handicapped lavatories that receive hot water shall be insulated with Truebro Model # 102W insulation kit.

PART 3 - EXECUTION

3.1 SOIL, WASTE AND VENT PIPING

- A. Buried Piping: Soil, waste and storm pipe and fittings below the floor slab and to the building 5 foot line shall be of the Schedule 40 PVC plastic and shall be provided with a locator wire #12 gage installed per manufacturer's recommendations.
- B. Above Grade: Soil, waste and vent piping and fittings shall be Schedule 40 PVC plastic.
- C. Underfloor Conduit: Steel piping. 90 degree elbows shall be of the long sweep type.
- D. Waste and vent piping located in a plenum shall be cast-iron.

3.2 DOMESTIC HOT AND COLD WATER PIPING

- A. Pipe shall be chlorinated polyvinyl chloride (CPVC) type with solvent cement fittings.

3.3 CLEANING AND PROTECTION OF PIPE

- A. Before being placed in position, pipe and fittings shall be cleaned carefully. All pipe shall be maintained in a clean condition.

3.4 PIPE IN TRENCHES

- A. Sewer and water piping shall be placed in separate trenches.
- B. Water piping shall be buried at a depth of 6 inches below the frost line or a minimum of 12 inches, whichever is greater.

3.5 BELL AND SPIGOT CAST IRON SOIL PIPING (IF USED)

- A. Bell and spigot cast iron soil piping shall be laid with bell ends pointing up-grade. Pipe shall be graded carefully and shall be supported firmly and uniformly at its proper elevation and grade. Adjacent length of pipe shall be adjusted with reference to each other; blocking or wedging between hub and spigot will not be permitted. Spigots shall be adjusted in bells so as to give a uniform space all around. Open ends of pipes shall be closed by a watertight plug at the end of each day's work.

3.6 CAULKED AND LEADED JOINTS (IF USED)

- A. Bell and spigot pipe shall have braided or twisted hemp or oakum gaskets of the best commercial grade and shall provide not less than one inch depth for leading. Gaskets shall not project into the bore of the finished joints. After gaskets are placed, the joints shall be cleaned and the remaining space filled at one pouring with lead which shall be caulked in a manner that will assure tight joints with straining the iron of the bells. After caulking, the lead shall be practically flush with face of the bells. The lead shall contain not less than 99.7 percent pure lead.

3.7 BAND AND SCREW ASSEMBLIES (IF USED)

- A. Band and screw assemblies used in conjunction with hubless type cast iron soil pipe shall be tightened to 60 inch pounds torque on each band screw with a torque wrench specifically designed for the purpose. Each screw shall be retorqued after not less than 24 hours. The use of screwdrivers or various types of wrenches will not be permitted for this purpose.

3.8 INSTALLATION OF SCREW-JOINTED PIPING (IF USED)

- A. All piping shall be cut accurately to measurements established by the Contractor and shall be worked into place without springing or forcing. Proper provision shall be made for the expansion and contraction of all pipe lines. Pipe and fittings shall be free from fins and burrs. Screw joints in water piping shall be made with a lubricant applied on the male threads only. Threads shall be full cut and not more than three threads on the pipe shall remain exposed. All ferrous pipe thread, after being installed and tested, shall be given one coat of red lead and oil paint. Unions and union type connections and shut-off valves shall be provided for all fixtures and equipment ready for disconnection. On ferrous pipe 3 inches in diameter and smaller, unions shall be 150 pound steam-working-pressure malleable iron ground joint type. On ferrous pipe 4 inches in diameter and larger, unions shall be 125 pound steam-working-pressure forged steel flange type, with gaskets of 1/16 inch thick best quality rubber or cloth inserted rubber. Pipe hung from ceilings shall be supported by heavy adjustable hangers conforming to MSS SP-59 and SP-69. All hangers and collars shall be of sizes suitable for the weight of the pipe. All changes in sizes of pipe shall be made with reducing fittings.

3.9 WATER HAMMER ARRESTORS

- A. Water hammer arrestors shall be provided instead of site-fabricated air chambers, and shall be sized as required and installed in accordance with the manufacturer's recommendations. Arrestors shall be of the maintenance free (sealed) type.

3.10 WATER SYSTEMS

- A. Water systems shall be installed with a fall towards the shut-off valve or the lowest fixture. Branches from hot and cold water lines shall be provided to fixtures, water heating units, and outlets as indicated.

3.11 SANITARY SYSTEMS

- A. Sanitary and storm systems shall be provided where applicable, with Y fittings and 1/8 or 1/16 bends or combination Y and 1/8 bends. All fixtures not specified to be provided with traps as integral parts of their outfits and all drains shall have separate traps with cleanouts. Waste and storm lines shall be not less than 2 inches in diameter. All fixtures shall be individually vented, or shall be connected to a vented soil or waste line. Unless indicated otherwise, sanitary piping shall form circuit or loop vent with no dead ends or inverted siphons. Circuit or loop vent lines shall be connected at a height of not less than 12 inches above the fixtures served. Horizontal vents shall slope down to waste or soil branch or stack. Horizontal soil, waste and storm piping, generally, shall be graded 1/8 inch per foot. Vertical stacks shall be extended full size as vents to not less

than 12 inches above the roof and shall be placed in position before the roofing is applied. Where practicable, two or more vent lines may be connected and extended as one pipe through the roof. Cleanouts shall be installed at the foot of each soil or waste line, at changes in direction in the lines, and where indicated; however, within the buildings, the distance between cleanouts in horizontal runs shall in no case exceed 50 feet. Cleanouts in floors shall be extended full size to the floor level with outlets fitted with trap screws with countersunk caps. Cleanouts shall be pipe size except no cleanout shall exceed 6 inches in diameter. Vent flashing at the roof shall extend not less than 8 inches from the vent pipe in all directions. Lead flashing shall be turned down into the pipes or hubs.

3.12 WATER VALVES

- A. Water valves shall be installed in accessible places and shall be located as follows: (1) valve with hose connection on the building side of the main shut-off valve; (2) shut-off valve on each supply to each fixture not provided with compression stop; (3) valves shall be provided on all branches serving more than one fixture. Where valves are located in a non-accessible location, an access panel shall be provided and submitted for approval.

3.13 INSTALLATION OF FIXTURES

- A. Connections between water closets and the flanges on soil pipe shall be made gas and water tight with one piece special molded gasket. All bulk material including putty and plastics shall not be used. Floor drains shall be secured to the waterproofing or flashing in a watertight manner. Exact rough-in locations for fixtures and floor drains shall be determined from the Architectural Drawings. Contractor shall replace existing watercloset floor flanges when replacing a watercloset.

3.14 PIPE SLEEVES

- A. Pipe sleeves shall be provided where pipes pass through masonry or concrete walls, floors, roofs and partitions. Sleeves shall be placed during construction of the building and at no time shall jack hammers be used. Sleeves in outside walls below and above grade, or in floor slabs, shall be zinc-coated sheet steel. Space between pipe, tubing or insulation and the sleeve, shall be not less than 1/4 inch. Sleeves shall be held securely in proper position and location before and during construction. All sleeves shall be of sufficient length to pass through entire thickness of walls, partitions or slabs. Sleeves in floor slabs shall extend 2 inches above the finished floor. Space between the pipe and the sleeve shall be firmly packed with oakum and caulked on both ends of the sleeve with insulating cement. Sleeves located in waterproofed construction shall be provided with flange and clamping ring. Sleeves are not required in floor slabs located on grade, except that copper pipe shall not come in contact with concrete. All penetrations through fire rated walls and floors shall be sealed in a manner to maintain the integrity of this fire rating and meet Life Safety Codes.
- B. Provide termite protection in accordance with FBC 1816.2 at all pipe penetrations through slab or grade floors. Provide rodent proofing in accordance with FBC 443.3 and Appendix F. All openings in walls and floors for piping shall be covered with wire cloth or sheet metal guards per Code.

3.15 SUPPORTS AND FASTENINGS

- A. Plumbing fixtures, trimmings, accessories and appurtenances shall be secured to concrete by 1/4 inch brass expansion bolts not less than 4 inches long, and to gypsum with steel plates 1/8 inch thick, 6 inches wide and not less than 24 inches long at the back of the through bolts. Expansion bolts shall be of a length sufficient to extend at least 3 inches into solid concrete. Through bolts shall be provided with plates or washers at the back and set so that heads, nuts and washers will be concealed by the wall material. Exposed heads of bolts and nuts shall be nickel-chromium-

plated hexagons with rounded tops. Where necessary, nickel-chromium-plated brass washers shall be provided.

3.16 ANCHORING, GUIDING AND SUPPORTING OF PIPING

- A. All piping shall be anchored and supported in a manner such that expansion and contracting will take place in the direction desired and vibration and undue strains on equipment will be prevented by use of vibration dampeners. Hangers used for the support of piping, 2 inch nominal pipe size pipe and larger, shall be fabricated to permit adequate adjustment after erection while still supporting the load. Wall brackets shall be used where pipes are adjacent to wall or other vertical surfaces which may be used for supports. Supports shall be provided with a type 40 pipe covering protection saddle at each support in accordance with Table 4 of MSS SP-69. Pipe supports shall be spaced to provide adequate support for the pipes, the medium in the pipe, insulation, valves and fittings; spacing of supports shall be such as to prevent the forming of pockets. The maximum horizontal spacing for metal piping between pipe supports shall conform to Table 3 of MSS SP-69, except that cast iron soil pipe shall have a maximum spacing between hangers of 5 feet. Vertical piping shall be supported by bolted steel clamps or type conforming to MSS SP-69.

3.17 STERILIZATION

- A. Prior to starting work, verify system is complete, flushed and clean.
- B. Ensure PH of water to be treated is between 7.4 and 7.6 by adding alkali (caustic soda or soda ash) or acid (hydrochloric).
- C. Inject disinfectant, free chlorine in liquid, powder, tablet or gas form, throughout system to obtain 50 to 80 mg/L residual.
- D. Bleed water from outlets to ensure distribution and test for disinfectant residual at minimum 15 percent of outlets.
- E. Maintain disinfectant in system for 24 hours.
- F. If final disinfectant residual tests less than 25 mg/L, repeat treatment.
- G. Flush disinfectant from system until residual equal to that of incoming water or 1.0 mg/L.
- H. Take samples no sooner than 24 hours after flushing, from 10 percent of outlets and from water entry, and analyze in accordance with AWWA C651.
- I. A testing firm company specializing in testing potable water systems shall be approved by the State.
- J. A Certificate shall be submitted to Owner that cleanliness of water distribution system meets or exceeds State HRS requirements.
- K. On renovation work all procedures required above will be required for piping downstream of any shut-off valve turned off in order to do the work.
- L. If building is to be occupied Contractor shall provide bottled water until Certificate has been received.

3.18 SAFETY CODE

- A. All piping in accordance with ANSI A13.1-1981.

3.19 INSTRUCTION MANUALS

- A. Furnish four complete copies of instructions explaining operation and maintenance and replacement parts lists of the following equipment:
 1. Domestic Water Heater
 2. Electric Water Coolers
 3. Faucet Trim
 4. Flush Valves
 5. Thermostatic Mixing Valves

3.20 AS-BUILT DRAWINGS

- A. Provide a complete set of reproducible "As-Built" drawings at job completion. Upon request, the Architect will provide the Contractor with reproducible copies of the contract drawings for the use in making these "As-Built" drawings.

3.21 FIELD TESTS

- A. Water supply piping shall be subjected to a hydrostatic pressure test of 100 psi minimum. Pressure shall be maintained on the lines for a period of time sufficient to examine the entire system but not less than one hour.
- B. Sanitary Piping: Before the installation of any fixtures, the ends of the system shall be capped and all lines filled with water to the roof and allowed to stand until a thorough inspection has been made. After the fixtures are set, a smoke or equivalent test shall be made using a suitable apparatus.

END OF SECTION

SECTION 23 03 01

BASIC MECHANICAL REQUIREMENTS

PART 1 GENERAL

1.1 GENERAL REQUIREMENTS

- A. The requirements of the Contract Documents apply to all work in all sections of Division 23.

1.2 SCOPE OF WORK

- A. All building are to be served by independent rooftop air handling systems with a combination of air and temperature control schemes. Single constant air volume, central air station handler with face and bypass dampers in combination with individual zone temperature control.
- B. Library Building will be conditioned by multiple rooftop single zone heat pumps with electric heat backup for new. Existing RTU's to remain in service.
- C. The duct systems will be sheetmetal per SMACNA for low to medium pressure construction, seal joints using high pressure duct sealant and flanged joint assemblies. Runout ductwork will be a combination of rigid and flexible to meet the conditions of construction and budget. Flexible ductwork to be limited to a maximum of 5' - 0". Return air duct systems will be utilized where and when allowed by building construction type and design method. All ductwork in concealed spaces will be insulated with a minimum of 2 inch thick 3/4 lb. density foil faced duct insulation. Ductwork exposed and in mechanical room will be insulated with 2 inch thick rigid insulation three pound density. All duct insulation ends and seams to be sealed airtight with mastic and mesh embedment to preserve the integrity of the vapor barrier. Flexible ductwork connections to be secured with tie wraps and mastic embedded sealant and shall have foil face plenum wrap. All supply, return, and outside air duct systems shall be fully insulated. Exhaust ductwork shall be insulated.
- D. The Mechanical Contractor shall provide a complete Test and Balance of systems and furnish a Certified Report. Testing shall be within industry certification standard plus and minus limits or not more than $\pm 5\%$ of Design Scheduled Data, whichever is more stringent.
- E. Diffusers throughout thenew facility will be aluminum multi-core, multi-directional selected for NC 30 to 35 maximum. Return to match diffusers. Exhaust and transfer grilles to be $\frac{1}{2}$ x $\frac{1}{2}$ inch egg crate - aluminum.

1.3 INTENT

- A. It is the intention of these Specifications and Drawings to call for finished work, tested, and ready for operation. Wherever the word "provide" is used, it shall mean "furnish and install complete and ready for use".

1.4 CODES, RULES, REGULATIONS, PERMITS AND FEES

- A. All work shall comply with governing codes, ordinances and regulations of City, County, State and Federal authority having jurisdiction. Where local codes are not applicable, the work shall comply with the National Electrical Code, Standard Plumbing Code and Standard Mechanical Code. If

EXHIBIT "A"

two or more codes apply and are at a variance, the more stringent shall apply.

- B. Notify the Engineer of any observed conflicts between the Contract Documents and governing code. Engineer will issue instructions as to procedures. If the Contractor performs any work knowing it to be contrary to governing code and without notice to the Owner, he shall assume full responsibility therefore and shall bear all costs attributable thereto.
- C. All material and equipment for the electrical portions of the mechanical system shall bear the approval label or shall be listed by the Underwriters' Laboratories, Incorporated.

1.5 COMPLETE PERFORMANCE OF THE WORK

- A. Work shall be executed in strict accordance with the best practice of the trades in a thorough, substantial, workmanlike manner by competent workmen.

1.6 DRAWINGS

- A. The drawings are diagrammatic and attempt to give reasonable indications of the locations of apparatus. The drawings are not intended to show each item of material or a complete detail of all work to be done, but are for the purpose of illustrating material sizes, minimum equipment performance and special conditions necessary for the experienced mechanic to take off his material and, in conjunction with job site measurements, lay out his work. Each location shall be determined by reference to the Contract Drawings and Specifications and by actual measurements at the building, and in all cases shall be subject to the approval of the Engineer. Drawings are in no way to be scaled. The architectural drawings and details shall be examined for location of fixtures and equipment. All ductwork shall be located to miss other equipment, light fixtures, and piping.

1.7 SUBMITTALS

- A. General: The Contractor shall make submittals as required by the specifications. The Engineer may request submittals in addition to those specified when deemed necessary to adequately describe the work covered in the respective sections. Units of weights and measures used on all submittals shall be the same as those used in the contract drawings or larger as required herein. Each submittal shall be complete and in sufficient detail to allow ready determination of compliance with contract requirements. Prior to submittal, all items shall be checked and approved by the Contractor, and each item shall be stamped, signed, and dated indicating action taken. Proposed deviations from the contract requirements shall be clearly identified. Submittals shall include items such as: Contractor's, manufacturer's, or fabricator's drawings; descriptive literature including (but not limited to) catalog cuts, diagrams, operating charts or curves; test reports; test cylinders; samples; O&M manuals (including parts list); certifications; warranties; and other such required submittals. Samples remaining upon completion of the work shall be picked up and disposed of in accordance with manufacturer's Material Safety Data Sheets (MSDS) and in compliance with existing laws and regulations.
- B. Definitions
 - 1. Shop Drawings
 - a. Drawings, diagrams and schedules specifically prepared to illustrate some portion of the work.
 - b. Diagrams and instructions from a manufacturer or fabricator for use in producing the product and as aids to the Contractor for integrating the product or system into the project.
 - c. Drawings prepared by or for the Contractor to show how multiple systems and interdisciplinary work will be coordinated.
 - 2. Product Data
 - a. Catalog cuts, illustrations, schedules, diagrams, performance charts, instructions and

EXHIBIT "A"

- brochures illustrating size, physical appearance and other characteristics of materials or equipment for some portion of the work.
- b. Samples of warranty language when the contract requires extended product warranties.
3. Samples
 - a. Physical examples of materials, equipment or workmanship that illustrate functional and aesthetic characteristics of a material or product and establish standards by which the work can be judged.
 - b. Color samples from the manufacturer's standard line (or custom color samples if specified) to be used in selecting or approving colors for the project.
 - c. Field samples and mock-ups constructed on the project site establish standards by which the ensuring work can be judged. Includes assemblies or portions of assemblies which are to be incorporated into the project and those which will be removed at conclusion of the work.
 4. Design Data
 - a. Calculations, mix designs, analyses or other data pertaining to a part of work.
 - b. Design Submittals and extensions of design submittals.
 5. Test Reports
 - a. Report signed by authorized official of testing laboratory that a material, product or system identical to the material, product or system to be provided has been tested in accord with specified requirements. **Testing must have been within three years of date of contract award for the project.**
 - b. Report which includes findings of a test required to be performed by the Contractor on an actual portion of the work or prototype prepared for the project before shipment to job site.
 - c. Report which includes finding of a test made at the job site or on sample taken from the job site, on portion of work during or after installation.
 - d. Investigation reports.
 - e. Daily checklists.
 - f. Final acceptance test and operational test procedure.
 6. Certificates
 - a. Statements printed on the manufacturer's letterhead and signed by responsible officials of manufacturer of product, system or material attesting that product, system or material meets specification requirements. Must be dated after award of project contract and clearly name the project.
 - b. Document required of Contractor, or of a supplier, installer or subcontractor through Contractor, the purpose of which is to further quality of orderly progression of a portion of the work by documenting procedures, acceptability of methods or personnel qualifications.
 - c. Confined space entry permits.
 - d. Text of posted operating instructions.
 7. Manufacturer's Instructions
 - a. Preprinted material describing installation of a product, system or material, including special notices and Material Safety Data sheets concerning impedances, hazards and safety precautions.
 8. Manufacturer's Field Reports
 - a. Documentation of the testing and verification actions taken by manufacturer's representative to confirm compliance with manufacturer's standards or instructions.
 - b. Factory test reports.
 9. Operation and Maintenance Data
 - a. Data that is furnished by the manufacturer, or the system provider, to the equipment operating and maintenance personnel. This data is needed by operating and maintenance personnel for the safe and efficient operation, maintenance and repair of the item.
 10. Closeout Submittals
 - a. Documentation to record compliance with technical or administrative requirements or to establish an administrative mechanism.
 11. Approving Authority
 - a. Office authorized to approve submittal.

12. Work

- a. As used in this section, on- and off-site construction required by contract documents, including labor necessary to produce submittals, construction, materials, products, equipment, and systems incorporated or to be incorporated in such construction.

C. Submittals

- 1. Engineers' approval is required for all submittals.

D. Procedures for Submittals

- 1. Reviewing, Certifying, Approving Authority
 - a. Contractor organization shall be responsible for reviewing and certifying that submittals are in compliance with contract requirements. Approving authority on submittals is Engineer of Record unless otherwise specified for specific submittal.
- 2. Constraints
 - a. Submittals listed or specified in this contract shall conform to provisions of this section, unless explicitly stated otherwise.
 - b. Submittals shall be complete for each definable feature of work; components of definable feature interrelated as a system shall be submitted at same time.
 - c. When acceptability of a submittal is dependent on conditions, items, or materials included in separate subsequent submittals, submittal will be returned without review.
 - d. Approval of a separate material, product, or component does not imply approval of assembly in which item functions.
- 3. Scheduling
 - a. Coordinate scheduling, sequencing, preparing and processing of submittals with performance of work so that work will not be delayed by submittal processing. Allow for potential requirements to resubmit.
 - b. Except as specified otherwise, allow review period, beginning with receipt by approving authority, that includes at least 30 working days for submittals for approval and 20 working days for submittals for approval. Period of review for submittals begins when Engineer receives submittal.
 - c. For submittals requiring review by multiple disciplines or engineers, allow review period, beginning when Engineer receives submittal.
- 4. Variations
 - a. Variations from contract requirements require Engineer's 10 day prior written approval (where allowed), must be one of three manufacturers listed, or of the single manufacturer noted. No exceptions.
 - b. Considering Variations
 - 1) Discussion with Engineer prior to 10 day prior written submission, will help ensure functional and quality requirements are met and minimize rejections and resubmittals during Bidding and Construction period.
 - c. Proposing Variations
 - 1) When proposing variation, deliver written request to the Engineer, with documentation of the nature and features of the variation and why the variation is desirable and beneficial. If lower cost is a benefit, also include an estimate of the cost saving. In addition to documentation required for variation, include the submittals required for the item. Clearly mark the proposed variation in all documentation.
 - d. Warranting That Variations Are Compatible
 - 1) When delivering a variation for approval, Contractor warrants that this contract has been reviewed to establish that the variation, if incorporated, will be compatible with other elements of work.
- 5. Contractor's Responsibilities
 - a. Determine and verify field measurements, materials, field construction criteria; review

each submittal; and check and coordinate each submittal with requirements of the work and contract documents.

- b. Advise Engineer of variation, as required by paragraph entitled "Variations."
 - c. Correct and resubmit submittal as directed by approving authority. When resubmitting disapproved transmittals or transmittals noted for resubmittal, the Contractor shall provide copy of that previously submitted transmittal including all reviewer comments for use by approving authority. Direct specific attention in writing or on resubmitted submittal, to revisions not requested by approving authority on previous submissions.
 - d. Complete work which must be accomplished as basis of a submittal in time to allow submittal to occur as scheduled.
 - e. Ensure no work has begun until submittals for that work have been returned as "approved," or "approved as noted", except to the extent that a portion of work must be accomplished as basis of submittal.
6. Actions Possible
- a. Submittals will be returned with one of the following notations:
 - 1) Submittals marked "not reviewed" will indicate submittal has been previously reviewed and approved, is not required, does not have evidence of being reviewed and approved by Contractor, or is not complete. A submittal marked "not reviewed" will be returned with an explanation of the reason it is not reviewed. Resubmit submittals returned for lack of review by Contractor or for being incomplete, with appropriate action, coordination, or change.
 - 2) Submittals marked "approved" "approved as submitted" authorize Contractor to proceed with work covered.
 - 3) Submittals marked "approved as noted" or "approval except as noted; resubmission not required" authorize Contractor to proceed with work as noted provided Contractor takes no exception to the notations.
 - 4) Submittals marked "revise and resubmit" or "disapproved" indicate submittal is incomplete or does not comply with design concept or requirements of the contract documents and shall be resubmitted with appropriate changes. No work shall proceed for this item until resubmittal is approved.

E. Format of Submittals

- 1. Transmittal Form: Transmit each submittal, except sample installations and sample panels, to office of approving authority. Transmit submittals with transmittal form prescribed by Engineer and standard for project. The transmittal form shall identify Contractor, indicate date of submittal, and include information prescribed by transmittal form and required in paragraph entitled "Identifying Submittals." Process transmittal forms to record actions regarding sample panels and sample installations.
- 2. Identifying Submittals: Identify submittals, except sample panel and sample installation, with the following information permanently adhered to or noted on each separate component of each submittal and noted on transmittal form. Mark each copy of each submittal identically, with the following:
 - a. Project title and location.
 - b. Construction contract number.
 - c. Section number of the specification section by which submittal is required.
 - d. Submittal description number of each component of submittal.
 - e. When a resubmission, add alphabetic suffix on submittal description, for example, "-A", to indicate resubmission.
 - f. Name, address, and telephone number of subcontractor, supplier, manufacturer and any other second tier Contractor associated with submittal.
 - g. Product identification and location in project.
- 3. Format for Shop Drawings
 - a. Shop drawings shall not be less than 8 1/2 by 11 inches nor more than 30 by 42 inches.
 - b. Present 8 1/2 by 11 inches sized shop drawings as part of the bound volume for submittals required by section. Present larger drawings in sets.

- c. Include on each drawing the drawing title, number, date, and revision numbers and dates, in addition to information required in paragraph entitled "Identifying Submittals."
 - d. Dimension drawings, except diagrams and schematic drawings; prepare drawings demonstrating interface with other trades to 3/8" -1'-0" scale. Identify materials and products for work shown.
 - e. Drawings shall include the nameplate data, size and capacity.
4. Format of Product Data and Manufacturer's Instruction's
- a. Present product data submittals for each section as a complete, bound volume. Include table of contents, listing page and catalog item numbers for product data.
 - b. Indicate, by prominent notation, each product which is being submitted; indicate specification section number and paragraph number to which it pertains.
 - c. Supplement product data with material prepared for project to satisfy submittal requirements for which product data does not exist. Identify this material as developed specifically for project, with information and format as required for submission of Certificates.
 - d. Product data shall include the manufacturer's name, trade name, place of manufacture, and catalog model or number. Should manufacturer's data require supplemental information for clarification, the supplemental information shall be submitted as specified for Certificates.
 - e. Where equipment or materials are specified to conform to industry and technical society reference standards of the organizations such as American National Standards Institute (ANSI), ASTM International (ASTM), National Electrical Manufacturer's Association (NEMA), Underwriters Laboratories (UL), and Association of Edison Illuminating Companies (AEIC), submit proof of such compliance. The label or listing by the specified organization will be acceptable evidence of compliance. In lieu of the label or listing, submit a certificate from an independent testing organization, competent to perform testing, and approved by the Engineer. The certificate shall state that the item has been tested in accordance with the specified organization's test methods and that the item complies with the specified organization's reference standard.
 - f. Submit manufacturer's instruction prior to installation.
5. Format of Samples
- a. Furnish samples in sizes below, unless otherwise specified or unless the manufacturer has prepackaged samples of approximately same size as specified:
 - 1) Sample of Equipment or Device: Full size.
 - 2) Sample of Materials Less Than 2 by 3 inches: Built up to 8 1/2 by 11 inches.
 - 3) Sample of Materials Exceeding 8 1/2 by 11 inches: Cut down to 8 1/2 by 11 inches and adequate to indicate color, texture, and material variations.
 - 4) Sample of Linear Devices or Materials: 10 inch length or length to be supplied, if less 10 inches. Examples of linear devices or materials are conduit and handrails.
 - 5) Sample of Non-Solid Materials: 750 ml or Pint. Examples of non-solid materials are sand and paint.
 - 6) Color Selection Samples: 2 by 4 inches.
 - 7) Sample Panel: 4 by 4 feet.
 - 8) Sample Installation: 100 square feet.
 - b. Samples Showing Range of Variation: Where variations are unavoidable due to nature of the materials, submit sets of samples of not less than three units showing extremes and middle of range.
 - c. Reusable Samples: Incorporate returned samples into work only if so specified or indicated. Incorporated samples shall be in undamaged condition at time of use.
 - d. Recording of Sample Installation: Note and preserve the notation of area constituting sample installation but remove notation at final clean up of project.
 - e. When color, texture or pattern is specified by naming a particular manufacturer and style, include one sample of that manufacturer and style, for comparison.
6. Format of Design Data and Certificates

- a. Provide design data and certificates on 8 1/2 by 11 inches paper. Provide a bound volume for submittals containing numerous pages.
 - 7. Format of Test Reports and Manufacturer's Field Reports
 - a. Provide reports on 1/2 by 11 inches paper in a complete bound volume.
 - b. Indicate by prominent notation, each report in the submittal. Indicate specification number and paragraph number to which it pertains.
 - 8. Format of Preconstruction Submittals and Closeout Submittals
 - a. When submittal includes a document which is to be used in project or become part of project record, other than as a submittal, do not apply Contractor's approval stamp to document, but to a separate sheet accompanying document.
 - b. Provide all dimensions in administrative submittals in metric. Where data are included in preprinted material with English units only, submit metric dimensions on separate sheet.
- F. Quantity of Submittals
- 1. Number of Copies of Shop Drawings
 - a. Submit six copies of submittals of shop drawings requiring review and approval only by Engineer.
 - 2. Number of Copies of Product Data and Manufacturer's Instructions
 - a. Submit in compliance with quantity requirements specified for shop drawings.
 - 3. Number of Samples
 - a. Submit two samples, or two sets of samples showing range of variation, of each required item. One approved sample or set of samples will be retained by approving authority and one will be returned to Contractor.
 - b. Submit one sample panel. Include components listed in technical section or as directed.
 - c. Submit one sample installation, where directed.
 - d. Submit one sample of non-solid materials.
 - 4. Number of Copies Design Data and Certificates
 - a. Submit in compliance with quantity requirements specified for shop drawings.
 - 5. Number of Copies Test Reports and Manufacturer's Field Reports
 - a. Submit in compliance with quantity with quality requirements specified for shop drawings.
 - 6. Number of Copies of Operation and Maintenance Data
 - a. Submit three copies of O&M Data to the Contracting Officer for review and approval.
 - 7. Number of Copies of Preconstruction Submittals and Closeout Submittals
 - a. Unless otherwise specified, submit administrative submittals compliance with quantity requirements specified for shop drawings.
- G. Approved Submittals: The Engineer's approval of submittals shall not be construed as a complete check, but will indicate only that the general method of construction, materials, detailing and other information are satisfactory design, general method of construction, materials, detailing and other information appear to meet the Solicitation and Accepted Proposal. Approval will not relieve the Contractor of the responsibility for any error which may exist, as the Contractor is responsible for dimensions, the design of adequate connections and details, and the satisfactory construction of all work. After submittals have been approved by the Engineer, no resubmittal for the purpose of substituting materials or equipment will be considered unless accompanied by an explanation of why a substitution is necessary and there will be a cost associated with the additional review of \$175/hour, \$500 minimum. The same applies for value engineering and product substitution analysis. Invoice is to be paid prior to release of reviewed submittal.
- H. Disapproved Submittals: The Contractor shall make all corrections required by the Contracting Officer and promptly furnish a corrected submittal in the form and number of copies specified for the initial submittal. The Contractor shall make all corrections required by the Engineer, obtain the Designer of Record's approval when applicable, and promptly furnish a corrected submittal in the form and number of copies specified for the initial submittal. Any "information only" submittal found to contain errors or unapproved deviations from the Solicitation or Accepted Proposal shall be resubmitted as one requiring "approval" action, requiring Designer of Record approval. If the

Contractor considers any correction indicated on the submittals to constitute a change to the contract, a notice in accordance with the Contract Clause "Changes" shall be given promptly to the Owner. Resubmittals shall be reviewed at an hourly rate of \$175/hour, \$500 minimum per required review.

- I. Withholding of Payment: Payment for materials incorporated in the work will not be made if required approvals have not been obtained. No payment for materials incorporated in the work will be made if all required Designer of Record approvals have not been obtained. No payment will be made for any materials incorporated into the work for any conformance review submittals or information only submittals found to contain errors or deviations from the Solicitation or Accepted Proposal.

1.8 SPACE LIMITATIONS

- A. Equipment shall be chosen which will properly fit into the physical spaces provided and indicated, allowing ample room for access, servicing, removal and replacement of parts, etc. Adequate space shall be allowed for clearance in accordance with the Code requirements and the requirements of the local inspection department. Physical dimensions and arrangements of equipment to be installed shall be subject to the Engineer review. However, since space requirements and equipment arrangement vary according to manufacturer, the responsibility for initial access and proper fit rests with the Contractor.
- B. Piping, domestic pressure piping, control conduit, roof drains or gravity piping shall be routed in the bar joist where and when possible such as to minimize conflicts with ductwork, light fixtures, ceilings, equipment and other items installed between the bottom of the bar joist and the ceiling.

1.9 COORDINATION AND INTERFERENCES

- A. The Contractor shall give full cooperation to other trades. Where the work of the Contractor will be installed in close proximity to or will interfere with work of other trades, he shall assist in working out space conditions to make a satisfactory adjustment. Shifting of ductwork to clear light fixtures, piping walls, conduit, equipment, etc. shall be the Contractor's responsibility and shall be considered cooperation with other trades. If required and/or directed by the Engineer, the Contractor shall prepare composite working drawings and sections at a scale of $\frac{1}{2}$ " is equal to 1'-0", clearly showing how his work is to be installed in relation to the work of other trades and structures or inserts in poured walls. If the Contractor installs his work before coordinating with other trades, or so as to cause any interference with work of other trades or structures, he shall make the necessary changes in his work to correct the condition without additional cost to the Owner.

1.10 SLEEVES, CUTTING AND PATCHING

- A. This Contractor shall be responsible for providing and the timely placing of sleeves for all piping passing through walls, partitions, beams, floors, and roof while same are under construction. A pipe sleeve shall be one size larger than the size of pipe it serves. If a pipe is insulated, its pipe sleeve shall be one size larger than the outside diameter of the insulation around the pipe. Sleeves set in concrete floor construction shall be 18 gauge galvanized steel except at pipe supports. Sleeves supporting pipes shall be Schedule 40 galvanized steel with three 6" long reinforcing rods welded at 120 degree spacing to the sleeve and shall be installed with the rods embedded in the concrete slab. Sleeves in floors shall extend four inches above the finished floor. All pipes passing through concrete or masonry walls shall have 18 gauge galvanized steel sleeves. If holes and/or sleeves are not properly installed and cutting and patching becomes necessary, it shall be done at no expense to the Owner by parties approved by the Engineer. The Contractor shall undertake no cutting or patching without first securing the Engineer's written

approval.

- B. Where a pipe passes through a sleeve, no point of the pipe or its insulation shall touch the sleeve. Caulk around such pipe with sufficient quantity of fire safing insulation to equal fire rating of construction and seal off opening between pipe and pipe sleeve with a non-hardening mastic.

1.11 ESCUTCHEONS

- A. Provide heavy chrome-plated or nickel-plated plates or approved pattern on piping passing through walls and ceiling in finishing areas. Escutcheons shall be B & G No. 10 or prior approved equal chrome-plated steel plates with concealed hinges. Pattern shall be approved by the Engineer.

1.12 EXCAVATION AND BACKFILL

- A. This Contractor shall make all necessary excavations, cutting of paving, concrete, etc., and do all backfilling and paving repairs necessary for the proper execution of the Mechanical work. All installations below grade shall have a minimum of 24 inches cover or greater where indicated herein or on Plans.

1.13 PAINTING

- A. Machinery furnished by this Contractor shall be factory-finished. If the factory finish is damaged during shipment, installation, etc., it shall be repainted subject to the Engineer's approval. See individual Specifications for additional painting requirements.

1.14 MATERIALS

- A. Materials and equipment shall be new and of first-class quality. The commercially standard items of equipment and the specific names mentioned herein are intended to fix the standards of quality and performance necessary for the proper functioning of the Mechanical Work.
- B. All materials and equipment covered in this specification shall be new and shall fit in spaces provided. All equipment, fixtures and accessories shall carry a guarantee against defects for a period of one (1) year from the date of acceptance. Each system, as a whole and in all its parts, shall be guaranteed to function correctly up to the specified capacity for a minimum of one (1) year. Should a system or any part thereof fail to meet performance requirements, necessary replacements, alterations or repairs shall be made to bring performance up to specified requirements. All building construction and finishes damaged or marred shall be restored to the satisfaction of the Owner's Representative. All the above described shall be done without cost to the Owner. Each major component of the equipment shall have the manufacturer's name, address and catalog number on a plate securely affixed in a conspicuous place. The above guarantee shall include the replacement of all refrigerant lost.
- C. Since manufacturing methods vary, reasonable minor equipment variations are expected; however, performance and material requirements are minimum. The Engineer retains the right to judge equality of equipment that deviates from the specifications.

1.15 WELDING SPECIFICATIONS

- A. All field made pressure vessel welds shall be radiographed (x-rayed) in accordance with the requirements of ASME/ANSI B31.9.
- B. All branch, fillet, and socket welds on piping system shall be TP (dye-checked), or MT (magnetic

particle) examined in accordance with the requirements of ASME/ANSI B31.9.

- C. The Contractor shall submit, as a Shop Drawing submittal, a copy of the Welding Procedure Specifications (WPS) that he plans to use on the project along with the Procedure Qualifications Records (PQR) that qualify these WPS's. All WPS's and PQR's shall be done in accordance with the requirements of ASME Section IX.
- D. All Welding Procedures Specifications (WPS) shall be qualified by the Contractor. Welding Procedures Specifications qualified by other Contractors or other Agencies will not be accepted. The Contractor must qualify all his own WPS's.
- E. All welders used on the project shall be qualified for the welds they will be making in accordance with ASME Section IX. The Welder Qualifications Performance (PQR) for each welder shall be current in accordance with the requirements of ASME Section IX.
- F. All welders used by the Contractor shall be tested and qualified under his employ and to the requirements of ASME IX. Welders who are qualified by other Contractors or Agencies will not be accepted. The Contractor must qualify his welders.
- G. The Welding Performance Qualifications (WPQ) for each welder shall be recorded on an appropriate form (QW-484) that indicates actual test variables and qualification ranges. The WPQ form for each welder shall be signed by the Contractor and certified. Copies of the WPQ records for each welder shall be submitted to the Engineer prior to any production welding on the project by the Contractor.

1.16 IDENTIFICATION OF EQUIPMENT, PIPING, AND VALVES

- A. Mechanical equipment and motor controllers shall be identified by means of nameplates permanently attached to the equipment. Nameplates shall be engraved laminated plastic with letters at least 1/4" high.
- B. Valves shall have identification markers, either engraved plastic or brass tags, permanently attached.
- C. Nameplate designations shall correspond to the identifications on the "Record Drawings" or "As Built Record Drawings".

1.17 EQUIPMENT PADS AND ANCHOR BOLTS

- A. Equipment pads shall be provided for all floor-mounted equipment, for all equipment supported off the floor on legs, and for all pipe support stands. An equipment pad shall generally conform to the shape of the piece of equipment it serves with a minimum 6" margin around the equipment and supports. Pads shall be 28-day, 3000 psi concrete reinforced with 6" x 6" 10/10 gauge welded wire mesh minimum or greater as indicated on Plans. Top and sides of pad shall be troweled to smooth finishes, equal to those of the floors, with all external corners bullnosed to a 3/4" radius with a minimum thickness of 3½ inches.
- B. The Contractor shall furnish templates and anchor bolts for all equipment placed on concrete equipment pads or on concrete slabs. Bolts shall be of the size and number recommended by the manufacturer of the equipment and shall be located by means of suitable templates. When equipment is placed on vibration isolators, the equipment shall be secured to the isolator and the isolator secured to the floor, pad, or support as recommended by the vibration isolation manufacturer.

1.18 LUBRICATION

- A. Where necessary, provide means for lubricating all bearings and other machine parts. If a part requiring lubrication is concealed or inaccessible, extend a lubrication tube with suitable fitting to an accessible location and suitably identify it.
- B. After installation, properly lubricate all parts requiring lubrication and keep them adequately lubricated until final acceptance by the Owner.

1.19 ACCESS DOORS

- A. Wherever access is required through walls or ceilings to valves, fire dampers, or other concealed equipment installed under this Division, the Contractor shall furnish and install a hinged access door and frame with a flush latch handle. Contractor shall furnish complete information to the Engineer as to the number, size and location of required access doors. All shall be finished to match adjacent surfaces or as approved by Architect/Engineer.

1.20 SMOKE DETECTORS

- A. Mechanical Contractor shall install smoke detectors provided by Fire Alarm Contractor. All Electrical and EMCS wiring to be by respective Contractors..

1.21 PRECLEANING AND PASSIVATION PROCEDURES FOR OPEN RECIRCULATING AND CLOSED LOOP COOLING SYSTEMS

A. General

1. The precleaning of the system refers to the removal of debris, solid materials, oil, corrosion products that have accumulated in the system, as it has been idle during construction or during a system shutdown. Precleaning is a combination of mechanical and chemical methods. Precleaning provides a clean, chemically reactive surface, which will react with corrosion passivation treatments.
2. The passivation or pre-filming of the system pertains to the promotion of the formation of protective oxide films, which will help prevent future corrosion. It is important to apply the passivation process immediately after the precleaning procedure to prevent incomplete formation and subsequent rapid corrosion and build up of associated corrosion products.
3. Other considerations include considering discharge limits on various chemical components used during the process. Use of lower pH waters may require neutralization prior to discharge. The dislodging of debris and corrosion product may increase clogging in filters. Backwashing and increased filter maintenance may be required.

B. Precleaning

1. Remove debris: Remove all accumulated debris such as wood, trash, leaves and sediments. Clean the deck, basin and screens by sweeping prior to filling the basin with fresh water. Avoid the use of wire brushes on galvanized surfaces.
2. Tower wood wash down for newly constructed or refurbished cooling towers: Wash tower wood down with fresh water prior to filling the tower basin. Water used for washing of tower wood shall be discharged prior to stating the chemical cleaning procedure. Tower wood structures shall be treated with copper based salts as microbiocides and removal of residual salts from the wood surfaces. **50 parts of active azole shall be present in the system during tower wood washing to complex copper solubilized during the wash down procedure.**
3. Flush and fill basin: Fill the tower basin with fresh water, preferably the same as will be used for system makeup. Circulate through supply and return header system and across tower before flushing exchangers if possible.

4. Flush and fill exchangers: Open drains at exchanger low points and back flush, if possible. Check back pressures and pressure drops to ensure there are no blockages. Depending on the size of the system, it is recommended to purge the system and refill with fresh makeup. If large volumes restrict a complete purge, blowdown the system and add fresh makeup to dilute the solids and iron.

C. Precleaning Option #1 - Ferroquest

1. Recommended for non-galvanized open recirculating systems and closed loop systems.
Caution: This procedure will remove galvanizing.
2. Products required:
 - a. Ferroquest FQ7101 or equal - A 0.5% to 2.0% of system volume charge of the product. For example, you will need between 50 and 200 gallons for a 10,000 gallon system.
 - b. Ferroquest FQ7102 neutralizer or equal - 0.1% of system volume of product. For example, you will need approximately 10 gallons for a 10,000 gallon system.
 - c. Anti-foam.
 - d. Non-oxidizing biocide to achieve 50 to 70 ppm. Do not exceed registered maximum as indicated on product label.
 - e. Maintain pH for 12 to 72 hours.
 - f. Monitor iron levels and pH.
3. Procedure:
 - a. Make sure there is enough excess system volume for the FQ7101 or equal product.
 - b. Make sure all automatic and manual valves are open for the entire cleaning.
 - c. Add heat load to system, attempting to maintain hot returns in the 120 to 160 degrees F range. Maintain temperatures below the maximum specified for the tower fill.
 - d. Charge system with FQ product or equal in an area of high mixing.
 - e. Recirculate and control pH in the 6.5 to 7.0 range. Add FQ7102 or equal as needed to keep pH in this range. If FQ7102 is not available you may use any excess FQ7101 for this purpose.
 - f. Recirculate the system for 12 to 72 hours. Lower concentrations of product will required longer recirculation times.
 - g. During cleaning, flush through drain valves occasionally during the cleaning to remove scales and deposits that have been liberated by the cleaning. Keep open for approximately 15 seconds.
 - h. Monitor iron levels and pH during the cleaning. If iron levels exceed 1200 ppm replace one-half the volume of the system with fresh water and add appropriate amount of new product.
 - i. When iron levels plateau or you run out of precleaning time, flush the system (for small cooling towers and closed loops) or blowdown heavy to remove product, iron and any scale removed. Flush through all valves and inspect for deadlegs.
 - j. Once system water is near make up water conductivity and iron levels, **immediately institute recommended water treatment program and avoid keeping pre-clean solution in system for long periods of time.**

D. Precleaning Option #2 - Multiple Chemical Approach for Non-Galvanized Systems

1. Products required:
 - a. HPS-1 dispersant product or equal to achieve 25 to 100 ppm active polymer.
 - b. HRA or equal to achieve 8 to 20 ppm active HRA.
 - c. Non-oxidizing biocide to achieve 50 to 75 ppm as product. Do not exceed registered maximum as indicated on product label.
 - d. Provide 100 to 200 ppm active pyrophosphate.
 - e. Surfactant at approximately 20 to 50 ppm as product - should provide oil/grease dispersancy as well as general surfactant properties.
 - f. Antifoam as needed.
 - g. If an oxidizing biocide is used at this point, keep levels at or below 1.0 ppm free residual chlorine.

EXHIBIT "A"

- h. Sulfuric acid may be required for pH control.
- 2. Procedure:
 - a. Make sure tower or system is full with fresh make up water. Begin to circulate water through system and bypass tower fill if possible.
 - b. Control pH in the 6.0 to 7.0 range.
 - c. Add chemicals to tower basin or system near pump screens show wise to achieve desired concentrations. Add products in order as given above or minimally, add HPS-1 or equal dispersant and HRA azole first.
 - d. Add heat load to system, attempting to maintain hot returns in the 120 to 160 degrees F range. Make sure to maintain temperatures below the maximum specified for the tower fill.
 - e. Circulate for 8 to 24 hours. If there is little heat load, allow to go for the full 24 hours.
 - f. After specified time open blowdown(s) to and makeup with fresh water. It is important to remove chemical and any dispersed solids, oils, etc. at this point.
 - g. **Immediately institute passivation/pre-filming procedure and avoid keeping precleaning solution in system for long periods of time.**
- E. Precleaning Option #3 - Galvanized Systems
 - 1. Make sure all chemicals are on-site and that pH control is available. If possible the tower or system should be exposed to atmosphere for 4 to 6 weeks prior to start up.
 - 2. Products required:
 - a. HPS-1 dispersant or equal product to achieve 25 to 100 ppm active polymer.
 - b. HRA or equal to achieve 8 to 20 ppm active HRA.
 - c. Non-oxidizing biocide to achieve 50 to 75 ppm as product. Do not exceed registered maximum as indicated on product label.
 - d. Surfactant at approximately 20 to 50 ppm as product - provide oil/grease dispersancy as well as general surfactant properties.
 - e. Antifoam as needed.
 - f. If an oxidizing biocide is used at this point, keep levels at or below 1.0 ppm free residual chlorine.
 - g. Sulfuric acid may be required for pH control.
 - 3. Procedure:
 - a. Make sure tower or system is full with fresh make up water. Begin to circulate water through system and bypass tower fill if possible.
 - b. Control pH in the 7.0 to 8.0 range.
 - c. Add chemicals to tower basin or system near pump screens shot wise to achieve desired concentrations. Add products in order as given above or minimally, add HPS-1 dispersant and HRA azole first.
 - d. Add heat load to system, attempting to maintain hot returns in the 120 to 160 degree F range. Make sure to maintain temperatures below the maximum specified for the tower fill.
 - e. Circulate for 8 to 24 hours. If there is little heat load, allow to go for the full 24 hours.
 - f. After specified time open blowdown(s) to and makeup with fresh water. It is important to remove chemical and any dispersed solids, oils, etc. at this point.
 - g. **Immediately institute passivation/pre-filming procedure and avoid keeping precleaning solution in system for long periods of time.**
- F. Passivation/Pre-Filming Option #1 - Chemical Procedure for Non-Galvanized Open Recirculating Systems
 - 1. Products Required: Utilize product or products to provide the following constituents. Consult water treatment company for appropriate products.
 - a. HPS-1 @ 20 to 100 ppm active polymer or equal.
 - b. HRA at approximately 5 to 20 ppm active azole or equal.
 - c. Orthophosphate levels for the following calcium levels:
 - 1) 35 to 100 ppm orthophosphate if Ca is <200 ppm.

- 2) 35 to 50 ppm orthophosphate if Ca is 200 to 400 ppm.
 - 3) 35 to 50 ppm orthophosphate if Ca is >400 ppm.
 - d. Non-oxidizing biocide to achieve 50 to 75 ppm as product. Do not exceed registered maximum as indicated on product label.
2. Procedure:
- a. Control pH in the 6.0 to 7.0 range.
 - b. Ideally temperature should be approximately 102 degrees F.
 - c. Add product(s) to achieve residuals as indicated above and add products in order shown above.
 - d. Circulate for 8 to 24 hours (24 hours if temperatures are near ambient).
 - e. Do not exceed a maximum of 48 hours.
 - f. Blowdown the system to achieve target residuals and ion levels prescribed by the standard treatment method. Adjust product feed rates of current product(s) or begin standard treatment program when desired cycles are reached.
 - g. Alkaline treatment programs can be started once the alkalinity is 150 ppm or greater and the phosphate level is <7 ppm. Decrease or stop acid feed to allow alkalinity to cycle up.
 - h. Continue circulation through all piping and exchangers to minimize corrosion and microbial fouling.
 - i. At this point, do not drain and dry the system. If this is done, the passivation program will have to be repeated.
 - j. Maintain all treatment programs including deposition, corrosion, and biocide to keep system in good operating order.
- G. Passivation/Pre-Filming Option #2 - Chemical Procedure for Passivation/Pre-Filming of Galvanized Open Recirculating Systems

- 1. For the first 30 to 60 days of system operation, control the system pH in the 7.0 to 8.0 range.
- 2. If an oxidizing biocide is used (chlorine or bromine based) keep free residual as chlorine below 1.0 ppm.
- 3. Maintain standard high orthophosphate, low phosphonate cooling water treatment programs during this time. Excessive phosphonate levels are detrimental to zinc coated surfaces.
- 4. Moderate calcium hardness levels of 100 to 300 ppm as CaCO₃ and alkalinity levels of 50 to 150 ppm as CaCO₃ are ideal during the 30 to 60 day passivation period.
- 5. Once the 60-day passivation period is complete, desired treatment technology can begin including programs that include higher cycles to achieve higher alkalinity and hardness levels.

1.22 OPERATING INSTRUCTIONS

- A. This Contractor shall provide the services of a competent Operating Engineer to supervise the operation of all equipment specified herein and to instruct the Owner's operators during an 8-hour operating period. The operating instruction period shall be identified as straight time working hours and shall not include nights, weekends, or travel time to and/or from the project.
- B. In addition, the manufacturers of the automatic temperature controls shall furnish the services of competent control men to instruct the Owner's operators as set forth in various sections. The operating instruction periods shall be as defined in the immediate preceding paragraph.
- C. The Owner shall be notified in writing at least five days before each operating instruction period begins. The Contractor shall commence no instruction period until the Owner has issued its written acceptance of the starting time.

1.23 OPERATING AND MAINTENANCE BOOKS

- A. The Contractor shall provide the Owner, through the Engineer, with operating instructions and

maintenance data books for all equipment and materials furnished under this Division.

- B. Include the following information where applicable.
1. Identify name and mark number.
 2. Locations (where similar items are used, provide a list).
 3. Complete nameplate data.
 4. Certified Record Drawings and Shop Drawings.
 5. Parts Lists.
 6. Performance Curves.
 7. Wiring Diagrams.
 8. Lubrication charts.
 9. Manufacturer's operating and maintenance instructions with all non-applicable information deleted.
 10. Supplier's name, address, and phone number.
- C. Maintenance instruction manuals shall include complete oiling, cleaning, and servicing data compiled in clearly and easily understandable form. Data shall show all series numbers of each piece of equipment, complete lists of replacement parts, motor ratings, and actual loads.
- D. In addition, a clear and concise operation diagram in a laminated cover shall be provided for each system. The location of these diagrams shall be coordinated with the Engineer and the Owner.
- E. Complete Test and Balance Report on each item.

1.24 WATERPROOFING

- A. Where roofing or waterproof members are pierced with piping and sleeves, Contractor shall provide waterproofing or comply as detailed. Where not detailed, provide lead flashing, oakum and lead caulking, lead sleeves and clamps, or other means approved by the Architect/Engineer to make the membrane watertight.

1.25 MACHINERY GUARDS

- A. Provide all belts, couplings, wheels, and other moving parts of machinery with easily removable metal guards. Provide tachometer openings for all belt-driven or variable speed machinery.

1.26 EQUIPMENT PROTECTION

- A. The Contractor shall protect all work and material from damage by his work or workmen, and shall be liable for all damage thus caused.
- B. The Contractor shall be responsible for all work and equipment until finally inspected, tested, and accepted by the Engineer and Owner; he shall carefully store material and equipment received on site and which are not immediately installed from the weather in a manner approved by the Owner.

1.27 MANUFACTURER'S RECOMMENDATIONS

- A. With exceptions as specified and/or indicated on the Drawings or in the specifications, apply, install, connect, erect, use, clean, and condition manufactured articles, materials, and equipment per manufacturer's current printed recommendations. Keep copies of such printed recommendations at Job Site and make them available to the Engineer. The most stringent requirements shall be enforced.

1.28 ELECTRICAL COMPONENTS FOR MECHANICAL EQUIPMENT

- A. The electrical components of mechanical equipment, such as motors, motor starters, control or push-button stations, float, temperature or pressure switches, solenoid valves, heating elements, contractors, transformers and relays and other devices functioning to control and operate mechanical equipment, and control wiring and conduit for circuits rated less than 100 volts are specified in the sections covering the associated mechanical equipment and/or controls. The interconnecting power wiring and conduit, control wiring rated 120 volts (nominal) and greater and associated conduit, and the electrical power circuits are specified in and provided by Division 26.
- B. All components, including but not limited to, motors, motor starters, control or push-button stations, float, temperature or pressure switches, solenoid valves, and other devices functioning to control mechanical equipment and the individual component fusible protection for accessory equipment shall be provided under Division 23 in accordance with the National Electrical Code and as specified herein. These components shall be furnished by the Division 23 equipment manufacturer whenever they are available as standard or optional accessories. Components which are not installed within the manufactured equipment shall be furnished as specified in Division 23 and 26 and installed as specified in Division 26, NEC and local codes. All components shall be of the highest quality as indicated by Contract Documents.
- C. Electrical work specified in this Division shall conform to applicable provisions of Electrical Division and drawings. All control wiring shall be in conduit.
- D. Disconnecting means shall be provided as required by the National Electrical Code and shall be fused or non-fused as required by equipment manufacturer's nameplate data or local code. Disconnecting means when available as a factory integral part of the equipment shall be furnished by the equipment manufacturer. All disconnects shall be as required by the equipment manufacturer, specified herein or indicated by Division 26 and on the Electrical Drawings.
- E. At the option of the Contractor or when specified or shown on the drawings external motor starters may be combined with the required disconnecting means as a combination starter. External combination starters and disconnecting means shall be furnished by Division 26 and installed as specified in Division 26. Internal combination motor starters and disconnects shall be furnished by equipment manufacturer in accordance to NEC, Division 26 and Electrical Drawings.
- F. It is the intent of these specifications to require complete and finished work, with all systems and equipment tested and ready for operation, in accordance with the sequence of operation. The Contractor shall be solely responsible for all required coordination between construction trades to ensure that all necessary components are furnished and installed in order to comply with the intent, Codes, manufacturer requirements, and Division 23 and 26 herein.

1.29 MOTORS FOR MECHANICAL EQUIPMENT

- A. All motors ½ horsepower and larger for fans, pumps, compressors, etc., shall be premium high efficiency type, totally enclosed fan cooled in all ambient, vault or damp to wet locations otherwise shall be open drip-proof and certified for VFD duty, squirrel cage induction type for operation at 60 hertz, phase and voltage as indicated on the electrical drawings, quiet ball bearing type, class S insulation, and shall include a motor terminal box meeting applicable codes.
- B. Where units are direct driven, the motor type may be as recommended by the equipment manufacturer unless noted otherwise in the Contract Documents. All belt driven motors shall have adjustable rails.
- C. Single phase motors 1/6 to 1/3 horsepower inclusive shall be split phase type for operation on 120 volt single phase current unless noted otherwise. Motors less than 1/6 horsepower shall be

shaded pole type.

- D. Single phase motors over 1/3 horsepower shall be capacitor start, induction run of the voltage indicated on the electrical drawings.

1.30 EQUIPMENT NOISE AND VIBRATION

- A. It is the intention to specify and for the Contractor to provide equipment and systems, that as defined herein, will be quiet and free of apparent vibration in operation.
- B. It is intended that vibration shall not be apparent to the senses in occupied areas of the building. To this end, both the balancing of rotating machinery and the installation of vibration isolation at various locations are required.
- C. It shall be the responsibility of the Contractor to obtain equipment that is quiet in operation as compared to other available equipment of its size, capacity, and type; to install equipment so that a minimum amount of noise and/or vibration is transmitted to the structure; and to fabricate the duct system so that air noises generated in the system are held to an absolute minimum.
- D. Any additional precautions deemed necessary to provide a quiet installation shall be done as part of the work of this contract, subject to approval of the Engineer and without additional cost to the Owner. After the system is in operation, it shall be the responsibility of this Contractor to make any changes to equipment or work installed that may be required to provide a system which is quiet in operation as defined herein.
- E. Refer to plans for any specific noise level requirements.

1.31 ELECTRICAL INSTALLATION REQUIREMENTS

- A. Electrical installations shall conform to IEEE C2, NFPA 70, and requirements specified herein in Division 23 and 26.
- B. All Work: Provide electrical components of mechanical equipment, such as motors, motor starters (except starters/ controllers which are indicated as part of a motor control center), control or push-button stations, float or pressure switches, solenoid valves, integral disconnects, and other devices functioning to control mechanical equipment, as well as control wiring and conduit for circuits rated 100 volts or less, to conform with the requirements of the section covering the mechanical equipment. Extended voltage range motors shall not be permitted. The interconnecting power wiring and conduit, control wiring rated 120 volts (nominal) and conduit, the motor control equipment forming a part of motor control centers, and the electrical power circuits shall be provided and installed under Division 26, except internal wiring for components of package equipment shall be provided as an integral part of the equipment. **WHEN MOTORS OR ELECTRICAL EQUIPMENT FURNISHED ARE DIFFERENT THAN SIZES INDICATED ON SCHEDULES, THE MECHANICAL CONTRACTOR SHALL PROVIDE AND COORDINATE ANY AND ALL REQUIRED CHANGES TO THE ELECTRICAL SERVICE WITH THE ELECTRICAL CONTRACTOR AS MAY BE NECESSARY AND RELATED WORK AS A PART OF THE WORK FOR THE SECTION SPECIFYING THAT MOTOR OR EQUIPMENT AT NO ADDITIONAL COST. ALL REQUIRED ELECTRICAL CHANGES AS PART OF THIS COORDINATION SHALL BE ACCOMPLISHED AS PART OF THIS CONTRACT AT NO ADDITIONAL COST TO THE OWNER.**

1.32 DATE OF COMPLETION AND TESTING OF MECHANICAL SYSTEMS

- A. The date for the final acceptance test shall be sufficiently in advance of the contract completion date to permit the execution before the expiration of the Contract of any adjustments and/or

alterations which the final acceptance tests indicate as necessary for the proper functioning of all equipment. Any such modifications shall be completed within the number of days allotted for completion of the Contract. Retests shall not relieve the Contractor for this Division of Completion date responsibility.

- B. After Substantial Completion the Contractor shall visit the site for 5 consecutive work days to ensure the equipment is operating appropriately.

1.33 FINAL REVIEW

- A. At a time designated by the Engineer, the entire system shall be reviewed. The Contractor shall be present at this review.
- B. The system shall be operating properly with all water and air volumes balanced and all temperature controls adjusted. All labels shall be removed from the plumbing fixtures and the fixtures shall be clean and in operating condition.
- C. Certificates and documents required herein shall be in order and presented to the Engineer at least four weeks prior to the review.
- D. After the review, any changes or corrections noted by the Engineer as necessary for the work to comply with these Specifications and the Drawings shall be accomplished without delay in order to secure final acceptance of the work.

1.34 GUARANTEE AND SERVICE

- A. Refer to General Conditions for guarantee. All Contractors for work under this Division shall have existing, a complete service office within 100 miles of job site.
- B. Where extended guarantees are called for herein, furnish three copies to be inserted in Instructions and Maintenance Manuals.
- C. The Contractor shall be responsible for labor to troubleshoot systems/equipment furnished by the Owner and all other systems/equipment called for by these Construction Documents for the duration of the minimum one year warranty period.
- D. Contractor shall perform preventative maintenance for a minimum period of one (1) year after substantial inspection and acceptance of project. Contractor shall provide all parts, labor, and fluids for all equipment supplied on this project for a minimum of one (1) year after Substantial Completion unless extended herein by specific Specification Sections.

1.35 PRODUCT APPROVAL

- A. All products submitted and used on this Project shall bear the Florida Product Approval Seal or be on the approved lists. Shop Drawings shall be accompanied with a letter indicating or have printed on them the Florida Product Approval Number. Approval shall be per Florida Statute 553.842.
- B. All products mounted on the building envelope (roof, walls, canopies, etc.) shall have Wind Load Certification from manufacturer indicating attachment requirements and details showing exactly how to install and attach products to building, roof curb, and/or roof to comply with Project Wind Load Certification.

EXHIBIT "A"

PART 2 PRODUCTS

Not Used

PART 3 EXECUTION

Not Used

END OF SECTION

SECTION 23 05 03

MECHANICAL IDENTIFICATION

PART 1 GENERAL

1.01 SUMMARY

- A. Section Includes:
 - 1. Nameplates.
 - 2. Tags.
 - 3. Stencils.
 - 4. Pipe markers.
 - 5. Ceiling tacks.
 - 6. Labels.
 - 7. Lockout devices.

- B. Related Sections:
 - 1. Section 09 90 00 - Paint and Coating: Execution for painting specified by this section.

1.02 REFERENCES

- A. American Society of Mechanical Engineers:
 - 1. ASME A13.1 - Scheme for the Identification of Piping Systems.

1.03 SUBMITTALS

- A. Section 01 33 00 - Submittal Procedures: Submittal procedures.
- B. Product Data: Submit manufacturers catalog literature for each product required.
- C. Shop Drawings: Submit list of wording, symbols, letter size, and color coding for mechanical identification and valve chart and schedule, including valve tag number, location, function, and valve manufacturer's name and model number.
- D. Samples: Submit two tags, labels, and pipe markers, actual size used on project.
- E. Manufacturer's Installation Instructions: Indicate installation instructions, special procedures, and installation.
- F. Manufacturer's Certificate: Certify products meet or exceed specified requirements.

1.04 CLOSEOUT SUBMITTALS

- A. Section 01 70 00 - Execution and Closeout Requirements: Closeout procedures.
- B. Project Record Documents: Record actual locations of tagged valves; include valve tag numbers.

1.05 QUALITY ASSURANCE

- A. Conform to ASME A13.1 for color scheme for identification of piping systems and accessories.
- B. Maintain one copy of each document on site.

EXHIBIT "A"

1.06 QUALIFICATIONS

- A. Manufacturer: Company specializing in manufacturing products specified in this section with minimum three years experience.
- B. Installer: Company specializing in performing Work of this section with minimum three years experience.

1.07 PRE-INSTALLATION MEETINGS

- A. Section 01 30 00 - Administrative Requirements: Pre-installation meeting.
- B. Convene minimum one week prior to commencing work of this section.

1.08 FIELD MEASUREMENTS

- A. Verify field measurements prior to fabrication.

1.09 EXTRA MATERIALS

- A. Section 01 70 00 - Execution and Closeout Requirements: Spare parts and maintenance products.
- B. Furnish two containers of spray-on adhesive and paint and 10% extra tags, stencils, pipe markers of all types, ceiling tacks, labels and furnished and installed for Owner's use on Project.

PART 2 PRODUCTS

2.01 NAMEPLATES

- A. Manufacturers:
 - 1. Craftmark Identification Systems.
 - 2. Safety Sign Co.
 - 3. Seton Identification Products.
 - 4. Substitutions: Not Permitted.
- B. Product Description: Laminated three-layer plastic with engraved black letters on light contrasting background color.

2.02 TAGS

- A. Plastic Tags: Laminated three-layer plastic with engraved black letters on light contrasting background color. Tag size minimum 1-1/2 inches (38 mm) diameter or square.
- B. Metal Tags: Brass, aluminum or stainless steel with stamped letters; tag size minimum 1-1/2 inches (38 mm) diameter or square with finished edges.
- C. Information Tags: Clear plastic with printed "Danger," "Caution," or "Warning" and message; size 3-1/4 x 5-5/8 inches (83 x 143 mm) with grommet and self-locking nylon ties.
- D. Tag Chart: Typewritten letter size list of applied tags and location in anodized aluminum frame plastic laminated.

2.03 STENCILS

- A. Stencils: With clean cut symbols and letters of following size:
 1. Up to 2 inches (51 mm) Outside Diameter of Insulation or Pipe: 1/2-inch high letters.
 2. 2-1/2 to 6 inches (64-150 mm) Outside Diameter of Insulation or Pipe: 1-inch letters.
 3. Over 6 inches (150 mm) Outside Diameter of Insulation or Pipe: 2-inch high letters.
 4. Ductwork and Equipment: 2-inch high letters.
- B. Stencil Paint: As specified in Section 09 90 00, semi-gloss enamel, colors and lettering size conforming to ASME A13.1.

2.04 PIPE MARKERS

- A. Color and Lettering: Conform to ASME A13.1.
- B. Plastic Pipe Markers: Factory fabricated, flexible, semi-rigid plastic, preformed to fit around pipe or pipe covering. Larger sizes may have maximum sheet size with spring fastener.
- C. Plastic Tape Pipe Markers: Flexible, vinyl film tape with pressure sensitive adhesive backing and printed markings.
- D. Plastic Underground Pipe Markers: Bright colored continuously printed plastic ribbon tape, minimum 6 inches (150 mm) wide by 4 mil (0.10 mm) thick, manufactured for direct burial service.

2.05 CEILING TACKS

- A. Description: Steel with 3/4 inch (19 mm) diameter color-coded head.
- B. Color code as follows:
 1. HVAC equipment: Yellow.
 2. Fire dampers/smoke dampers: Red.
 3. Plumbing valves: Green.
 4. Heating/cooling valves: Blue.

2.06 LABELS

- A. Description: Aluminum, polyester or laminated mylar, size 1.9 x 0.75 inches (48 x 19 mm), adhesive backed with printed identification.

2.07 LOCKOUT DEVICES

- A. Lockout Hasps: Anodized aluminum or reinforced nylon hasp with erasable label surface; size minimum 7-1/4 x 3 inches (184 x 76 mm).
- B. Valve Lockout Devices: Nylon, steel or plastic device preventing access to valve operator, accepting lock shackle.

PART 3 EXECUTION**3.01 PREPARATION**

- A. Degrease and clean surfaces to receive adhesive for identification materials.
- B. Prepare surfaces in accordance with Section 09 90 00 for stencil painting.

3.02 INSTALLATION

- A. Apply stencil painting in accordance with Section 09 90 00. Mark every 20 feet maximum spacing and at all branches.
- B. Install identifying devices after completion of coverings and painting.
- C. Install plastic nameplates with corrosive-resistant mechanical fasteners, or adhesive.
- D. Install labels with sufficient adhesive for permanent adhesion and seal with clear lacquer. For unfinished canvas covering, apply paint primer before applying labels.
- E. Install tags using corrosion resistant chain. Number tags consecutively by location.
- F. Install underground plastic pipe markers 6 to 8 inches (150 to 200 mm) below finished grade, directly above buried pipe.
- G. Identify air handling units, pumps, heat transfer equipment, tanks, and water treatment devices with plastic nameplates and/or stencil painting. Identify in-line pumps and other small devices with tags.
- H. Identify control panels and major control components outside panels with plastic nameplates.
- I. Identify valves in main and branch piping with tags.
- J. Identify air terminal units and radiator valves with numbered tags.
- K. Tag automatic controls, instruments, and relays. Key to control schematic.
- L. Identify piping, concealed or exposed, with plastic pipe markers, plastic tape pipe markers or stenciled painting. Use tags on piping 3/4 inch (20 mm) diameter and smaller. Identify service, flow direction, and pressure. Install in clear view and align with axis of piping. Locate identification not to exceed 20 feet (6 m) on straight runs including risers and drops, adjacent to each valve and tee, at each side of penetration of structure or enclosure, and at each obstruction.
- M. Identify all ductwork with stenciled painting. Identify with air handling unit identification number and area served. Locate identification at air handling unit, at each side of penetration of structure or enclosure, and at each obstruction. Label on 20 foot separations.
- N. Provide ceiling tacks to locate valves or dampers above T-bar type panel ceilings. Locate in corner of panel closest to equipment.

3.03 SCHEDULESIDENTIFICATION

- 1. All Equipment, Air Handling, etc.
- 2. Domestic Cold Water Piping.
- 3. Domestic Hot Water.
- 4. Ductwork.

VALVE TAGS

- 1. Domestic Cold Water

END OF SECTION

SECTION 23 05 13

MOTORS

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Single phase electric motors.
- B. Three phase electric motors.

1.02 RELATED SECTIONS

- A. Division 26 - Electrical: Electrical characteristics and wiring connections.

1.03 REFERENCES

- A. NEMA MG 1 - Motors and Generators.
- B. NFPA 70 - National Electrical Code.

1.04 SUBMITTALS

- A. Submit Product Data: Provide wiring diagrams with electrical characteristics and connection requirements.
- B. Test Reports: Indicate test results verifying nominal efficiency and power factor for three phase motors larger than 5 horsepower.
- C. Manufacturer's Installation Instructions: Indicate setting, mechanical connections, lubrication, and wiring instructions.

1.05 OPERATION AND MAINTENANCE DATA

- A. Submit Operation Data: Include instructions for safe operating procedures.
- B. Maintenance Data: Include assembly drawings, bearing data including replacement sizes, and lubrication instructions.

1.06 QUALIFICATIONS

- A. Manufacturer: Company specializing in manufacture of electric motors and their accessories, with minimum three years documented product development, testing, and manufacturing experience.

1.07 REGULATORY REQUIREMENTS

- A. Conform to applicable electrical code, NFPA 70, local energy code.
- B. Provide certificate of compliance from authority having jurisdiction indicating approval of high efficiency motors.

- C. Products Requiring Electrical Connection: Listed and classified by Underwriters' Laboratories, Inc., as suitable for the purpose specified and indicated.

1.08 DELIVERY, STORAGE, AND HANDLING

- A. Deliver, store, protect and handle products to site.
- B. Protect motors stored on site from weather and moisture by maintaining factory covers and suitable weather-proof covering. For extended outdoor storage, remove motors from equipment and store separately.

1.09 WARRANTY

- A. Provide five year parts and labor warranty.
- B. Warranty: Include coverage for motors 5.0 H.P. and larger.

PART 2 PRODUCTS

2.01 GENERAL CONSTRUCTION AND REQUIREMENTS

- A. Motors Less Than 250 Watts, for Intermittent Service: Equipment manufacturer's standard and need not conform to these specifications.
- B. Electrical Service:
 - 1. Refer to Division 26 for required electrical characteristics.
- C. Visible Nameplate: Indicating motor horsepower, voltage, phase, cycles, RPM, full load amps, locked rotor amps, frame size, manufacturer's name and model number, service factor, efficiency.
- D. Wiring Terminations:
 - 1. Provide terminal lugs to match branch circuit conductor quantities, sizes, and materials indicated. Enclose terminal lugs in terminal box sized to NFPA 70, threaded for conduit.
 - 2. For fractional horsepower motors where connection is made directly, provide conduit connection in end frame.
- E. All variable frequency controlled motors shall be VFD rated premium efficiency type. All others shall be premium efficiency motors for and internal to all equipment.

PART 3 EXECUTION

3.01 INSTALLATION

- A. Install in accordance with manufacturer's instructions.
- B. Install securely on firm foundation. Mount ball bearing motors with shaft in any position.
- C. Check line voltage and phase and ensure agreement with nameplate.

END OF SECTION

SECTION 23 05 13

MOTORS

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Single phase electric motors.
- B. Three phase electric motors.

1.02 RELATED SECTIONS

- A. Division 26 - Electrical: Electrical characteristics and wiring connections.

1.03 REFERENCES

- A. NEMA MG 1 - Motors and Generators.
- B. NFPA 70 - National Electrical Code.

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- A. Submit Product Data: Provide wiring diagrams with electrical characteristics and connection requirements.
- B. Test Reports: Indicate test results verifying nominal efficiency and power factor for three phase motors larger than 5 horsepower.
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- B. Electrical Service:
 1. Refer to Division 26 for required electrical characteristics.
- C. Visible Nameplate: Indicating motor horsepower, voltage, phase, cycles, RPM, full load amps, locked rotor amps, frame size, manufacturer's name and model number, service factor, efficiency.
- D. Wiring Terminations:
 1. Provide terminal lugs to match branch circuit conductor quantities, sizes, and materials indicated. Enclose terminal lugs in terminal box sized to NFPA 70, threaded for conduit.
 2. For fractional horsepower motors where connection is made directly, provide conduit connection in end frame.
- E. All variable frequency controlled motors shall be VFD rated premium efficiency type. All others shall be premium efficiency motors for and internal to all equipment.

PART 3 EXECUTION

3.01 INSTALLATION

- A. Install in accordance with manufacturer's instructions.
- B. Install securely on firm foundation. Mount ball bearing motors with shaft in any position.
- C. Check line voltage and phase and ensure agreement with nameplate.

END OF SECTION

SECTION 23 05 29

SUPPORTS AND ANCHORS

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Pipe hangers and supports.
- B. Hanger rods.
- C. Inserts.
- D. Flashing.
- E. Equipment curbs.
- F. Sleeves.
- G. Mechanical sleeve seals.
- H. Formed steel channel.
- I. Firestopping relating to mechanical work.
- J. Firestopping accessories.
- K. Equipment bases and supports.

1.02 RELATED SECTIONS

- A. Section 23 05 48 - Vibration Isolation.
- B. Section 23 07 00 - Mechanical Insulation.
- C. Section 22 05 02 - Plumbing Piping.
- D. Section 23 21 13 - Hydronic Piping.

1.03 REFERENCES

- A. American Society for Testing and Materials:
 - 1. ASTM E84 - Test Method for Surface Burning Characteristics of Building Materials.
 - 2. ASTM E119 - Method for Fire Tests of Building Construction and Materials.
 - 3. ASTM E814 - Test Method of Fire Tests of Through Penetration Firestops.
 - 4. ASTM F708 - Standard Practice for Design and Installation of Rigid Pipe Hangers.
- B. American Welding Society:
 - 1. AWS D1.1 - Structural Welding Code - Steel.
- C. Factory Mutual System:
 - 1. FM - Approval Guide, A Guide to Equipment, Materials & Services Approved By Factory Mutual Research For Property Conservation.

- D. Manufacturers Standardization Society of the Valve and Fittings Industry:
 1. MSS SP 58 - Pipe Hangers and Supports - Materials, Design and Manufacturer.
 2. MSS SP 69 - Pipe Hangers and Supports - Selection and Application.
 3. MSS SP 89 - Pipe Hangers and Supports - Fabrication and Installation Practices.
- E. Underwriters Laboratories Inc.:
 1. UL 263 - Fire Tests of Building Construction and Materials.
 2. UL 723 - Tests for Surface Burning Characteristics of Building Materials.
 3. UL 1479 - Fire Tests of Through-Penetration Firestops.
 4. UL - Fire Resistance Directory.
- F. Warnock Hersey:
 1. WH - Certification Listings.

1.04 DEFINITIONS

- A. Firestopping (Through-Penetration Protection System): Sealing or stuffing material or assembly placed in spaces between and penetrations through building materials to arrest movement of fire, smoke, heat, and hot gases through fire rated construction.

1.05 SYSTEM DESCRIPTION

- A. Firestopping Materials: ASTM E119, ASTM E814, UL 263, UL 1479 to achieve fire ratings not less than 1 hour fire rating.

1.06 REGULATORY REQUIREMENTS

- A. Conform to applicable code for support of plumbing hydronic piping.

1.07 PERFORMANCE REQUIREMENTS

- A. Firestopping: Conform to applicable code for fire resistance ratings and surface burning characteristics.
- B. Firestopping: Provide certificate of compliance from authority having jurisdiction indicating approval of materials used.

1.08 SUBMITTALS

- A. Division 01 - Submittal Procedures: Submittal procedures.
- B. Shop Drawings: Indicate system layout with location including critical dimensions, sizes, and pipe hanger and support locations and detail of trapeze hangers.
- C. Product Data:
 1. Hangers and Supports: Submit manufacturers catalog data including load capacity.
 2. Firestopping: Submit data on product characteristics, performance and limitation criteria.
- D. Firestopping Schedule: Submit schedule of opening locations and sizes, penetrating items, and required listed design numbers to seal openings to maintain fire resistance rating of adjacent assembly.
- E. Design Data: Indicate load carrying capacity of trapeze, multiple pipe, and riser support hangers. Indicate calculations used to determine load carrying capacity of trapeze, multiple pipe, and riser

support hangers.

F. Manufacturer's Installation Instructions:

1. Hangers and Supports: Submit special procedures and assembly of components.
2. Firestopping: Submit preparation and installation instructions.

G. Manufacturer's Certificate: Certify products meet or exceed specified requirements.

H. Engineering Judgements: For conditions not covered by UL or WH listed designs, submit judgements by licensed professional engineer suitable for presentation to authority having jurisdiction for acceptance as meeting code fire protection requirements.

1.09 QUALITY ASSURANCE

A. Perform Work in accordance with applicable authority for welding hanger and support attachments to building structure.

B. Maintain one copy of each document on site.

1.10 QUALIFICATIONS

A. Manufacturer: Company specializing in manufacturing Products specified in this section with minimum three years documented experience.

B. Installer: Company specializing in performing Work of this section with minimum 3 years documented experience.

1.11 PRE-INSTALLATION MEETINGS

A. Division 01 - Administrative Requirements: Pre-installation meeting.

B. Convene minimum one week prior to commencing work of this section.

1.12 DELIVERY, STORAGE, AND HANDLING

A. Division 01 - Product Requirements: Requirements for transporting, handling, storing, and protecting products.

B. Accept materials on site in original factory packaging, labeled with manufacturer's identification.

C. Protect from weather and construction traffic, dirt, water, chemical, and mechanical damage, by storing in original packaging.

1.13 ENVIRONMENTAL REQUIREMENTS

A. Division 01 - Product Requirements: Environmental conditions affecting products on site.

B. Do not apply firestopping materials when temperature of substrate material and ambient air is below 60 degrees F (15 degrees C).

C. Maintain this minimum temperature before, during, and for minimum 3 days after installation of firestopping materials.

1.14 FIELD MEASUREMENTS

- A. Verify field measurements prior to fabrication.

1.15 WARRANTY

- A. Division 01 - Execution Requirements: Product warranties and product bonds.
- B. Furnish five year manufacturer warranty for pipe hangers and supports.

PART 2 PRODUCTS**2.01 PIPE HANGERS AND SUPPORTS**

- A. Furnish materials in accordance with State of Florida and SREF standards.
- B. Hydronic Piping:
 1. Conform to ASME B31.9, ASTM F708, MSS SP58, MSS SP69, MSS SP89.
 2. Hangers for Pipe Sizes 1/2 to 1-1/2 inch (13 to 38 mm): Malleable iron or Carbon steel, adjustable swivel, split ring.
 3. Hangers for Cold Pipe Sizes 2 inches (50 mm) and Larger: Carbon steel, adjustable, clevis.
 4. Hangers for Hot Pipe Sizes 2 to 4 inches (50 to 100 mm): Carbon steel, adjustable, clevis.
 5. Hangers for Hot Pipe Sizes 6 inches (150 mm) and Larger: Adjustable steel yoke, cast iron roll, double hanger.
 6. Multiple or Trapeze Hangers: Steel channels with welded spacers and hanger rods.
 7. Multiple or Trapeze Hangers for Hot Pipe Sizes 6 inches (150 mm) and Larger: Steel channels with welded spacers and hanger rods, cast iron roll.
 8. Wall Support for Pipe Sizes 3 inches (76 mm) and Smaller: Cast iron hooks.
 9. Wall Support for Pipe Sizes 4 inches (100 mm) and Larger: Welded steel bracket and wrought steel clamp.
 10. Wall Support for Hot Pipe Sizes 6 inches (150 mm) and Larger: Welded steel bracket and wrought steel clamp with adjustable steel yoke and cast iron roll.
 11. Vertical Support: Steel riser clamp.
 12. Floor Support for Cold Pipe: Cast iron adjustable pipe saddle, lock nut, nipple, floor flange, and concrete pier or steel support.
 13. Floor Support for Hot Pipe Sizes 4 inches (100 mm) and Smaller: Cast iron adjustable pipe saddle, lock nut, nipple, floor flange, and concrete pier or steel support.
 14. Floor Support for Hot Pipe Sizes 6 inches (150 mm) and Larger: Adjustable cast iron roll and stand, steel screws, and concrete pier or steel support.
 15. Copper Pipe Support: Copper-plated, carbon steel ring.

2.02 ACCESSORIES

- A. Hanger Rods: Mild steel threaded both ends, threaded on one end, or continuous threaded.

2.03 INSERTS

- A. Inserts: Malleable iron case of galvanized steel shell and expander plug for threaded connection with lateral adjustment, top slot for reinforcing rods, lugs for attaching to forms; size inserts to suit threaded hanger rods.

2.04 FLASHING

- A. Metal Flashing: 24 gage (0.5 mm) thick aluminum steel.
- B. Metal Counterflashing: 22 gage (0.8 mm) thick aluminum steel.
- C. Lead Flashing:
 - 1. Waterproofing: 5 lb./sq. ft (24.5 kg/sq m) sheet lead
 - 2. Soundproofing: 1 lb./sq. ft (5 kg/sq m) sheet lead.
- D. Flexible Flashing: 47 mil (1.2 mm) thick sheet butyl; compatible with roofing.
- E. Caps: Aluminum Steel, 22 gage (0.8 mm) minimum; 16 gage (1.5 mm) at fire resistant elements.

2.05 EQUIPMENT CURBS

- A. Fabrication: Welded 16 gage (1.29 mm) aluminum steel shell and base, mitered 3 inch (75 mm) cant, factory installed wood nailer.

2.06 SLEEVES

- A. Sleeves for Pipes Through Non-fire Rated Floors: 18 gage (1.2 mm) thick galvanized steel.
- B. Sleeves for Pipes Through Non-fire Rated Beams, Walls, Footings, and Potentially Wet Floors: Steel pipe or 18 gage (1.2 mm) thick galvanized steel.
- C. Sleeves for Round Ductwork: Galvanized steel.
- D. Sleeves for Rectangular Ductwork: Galvanized steel.
- E. Sealant: Acrylic.

2.07 MECHANICAL SLEEVE SEALS

- A. Product Description: Modular mechanical type, consisting of interlocking synthetic rubber links shaped to continuously fill annular space between object and sleeve, connected with bolts and pressure plates causing rubber sealing elements to expand when tightened, providing watertight seal and electrical insulation.

2.08 FORMED STEEL CHANNEL

- A. Product Description: Galvanized 12 gage (2.8 mm) thick steel. With holes 1-1/2 inches (38 mm) on center.

2.09 FIRESTOPPING

- A. Product Description: Different types of products by multiple manufacturers are acceptable as required to meet specified system description and performance requirements; provide only one type for each similar application.
 - 1. Silicone Firestopping Elastomeric Firestopping: Single component silicone elastomeric compound and compatible silicone sealant.
 - 2. Foam Firestopping Compounds: Single component foam compound.
 - 3. Formulated Firestopping Compound of Incombustible Fibers: Formulated compound mixed with incombustible non-asbestos fibers.
 - 4. Fiber Stuffing and Sealant Firestopping: Composite of mineral fiber stuffing insulation with

silicone elastomer for smoke stopping.

5. Mechanical Firestopping Device with Fillers: Mechanical device with incombustible fillers and silicone elastomer, covered with sheet stainless steel jacket, joined with collars, penetration sealed with flanged stops.
6. Intumescent Firestopping: Intumescent putty compound which expands on exposure to surface heat gain.
7. Firestop Pillows: Formed mineral fiber pillows.

B. Color: As selected from manufacturer's full range of colors.

2.10 FIRESTOPPING ACCESSORIES

- A. Primer: Type recommended by firestopping manufacturer for specific substrate surfaces and suitable for required fire ratings.
- B. Installation Accessories: Provide clips, collars, fasteners, temporary stops or dams, and other devices required to position and retain materials in place.
- C. General:
 1. Furnish UL listed products.
 2. Select products with rating not less than rating of wall or floor being penetrated.
- D. Non-Rated Surfaces:
 1. Stamped steel, chrome plated, hinged, split ring escutcheons or floor plates or ceiling plates for covering openings in occupied areas where piping is exposed.
 2. For exterior wall openings below grade, furnish mechanical sealing device to continuously fill annular space between piping and cored opening or water-stop type wall sleeve.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Division 01 - Administrative Requirements: Verification of existing conditions before starting work.
- B. Verify openings are ready to receive sleeves.
- C. Verify openings are ready to receive firestopping.

3.02 PREPARATION

- A. Clean substrate surfaces of dirt, dust, grease, oil, loose material, or other matter affecting bond of firestopping material.
- B. Remove incompatible materials affecting bond.
- C. Do not drill or cut structural members.

3.03 INSTALLATION - INSERTS

- A. Install inserts for placement in concrete forms.
- B. Install inserts for suspending hangers from reinforced concrete slabs and sides of reinforced concrete beams.
- C. Provide hooked rod to concrete reinforcement section for inserts carrying pipe 4 inches (100 mm)

and larger.

- D. Where concrete slabs form finished ceiling, locate inserts flush with slab surface.

3.04 INSTALLATION - PIPE HANGERS AND SUPPORTS

- A. Install in accordance with ASTM F708, MSS SP 58, MSS SP 69, MSS SP 89.
- B. Support horizontal piping as scheduled.
- C. Install hangers with minimum 1/2 inch (13 mm) space between finished covering and adjacent work.
- D. Place hangers within 12 inches (300 mm) of each horizontal elbow.
- E. Use hangers with 1-1/2 inch (38 mm) minimum vertical adjustment.
- F. Support horizontal cast iron pipe adjacent to each hub, with 5 feet (1.5 m) maximum spacing between hangers.
- G. Where piping is installed in parallel and at same elevation, provide multiple pipe or trapeze hangers.
- H. Support riser piping independently of connected horizontal piping.
- I. Provide copper plated hangers and supports for copper piping.
- J. Design hangers for pipe movement without disengagement of supported pipe.
- K. Prime coat exposed steel hangers and supports. Hangers and supports located in crawl spaces, pipe shafts, and suspended ceiling spaces are not considered exposed.
- L. Provide clearance in hangers and from structure and other equipment for installation of insulation.

3.05 INSTALLATION - EQUIPMENT BASES AND SUPPORTS

- A. Provide housekeeping pads of concrete, minimum 3-1/2 inches (87 mm) thick and extending 6 inches (150 mm) beyond supported equipment. Refer to Division 3.
- B. Using templates furnished with equipment, install anchor bolts, and accessories for mounting and anchoring equipment.
- C. Construct supports of steel members. Brace and fasten with flanges bolted to structure.
- D. Provide rigid anchors for pipes after vibration isolation components are installed.

3.06 INSTALLATION - FLASHING

- A. Provide flexible flashing and metal counterflashing where piping and ductwork penetrate weather or waterproofed walls, floors, and roofs.
- B. Flash vent and soil pipes projecting 3 inches (75 mm) minimum above finished roof surface with lead worked 1 inch (25 mm) minimum into hub, 8 inches (200 mm) minimum clear on sides with 24 x 24 inches (600 x 600 mm) sheet size. For pipes through outside walls, turn flanges back into

wall and caulk, metal counter-flash, and seal.

- C. Provide acoustical lead flashing around ducts and pipes penetrating equipment rooms for sound control.
- D. Provide curbs for mechanical roof installations 14 inches (350 mm) minimum high above roofing surface. Flash and counter-flash with sheet metal; seal watertight. Attach Counterflashing mechanical equipment and lap base flashing on roof curbs. Flatten and solder joints.
- E. Adjust storm collars tight to pipe with bolts; caulk around top edge. Use storm collars above roof jacks. Screw vertical flange section to face of curb.

3.07 INSTALLATION - SLEEVES

- A. Exterior watertight entries: Seal with mechanical sleeve seals.
- B. Set sleeves in position in forms. Provide reinforcing around sleeves.
- C. Size sleeves large enough to allow for movement due to expansion and contraction. Provide for continuous insulation wrapping.
- D. Extend sleeves through floors 1 inch (25 mm) above finished floor level. Caulk sleeves.
- E. Where piping or ductwork penetrates floor, ceiling, or wall, close off space between pipe or duct and adjacent work with stuffing insulation and caulk airtight. Provide close fitting metal collar or escutcheon covers at both sides of penetration.
- F. Install stainless steel escutcheons at finished surfaces.

3.08 INSTALLATION - FIRESTOPPING

- A. Install material at fire rated construction perimeters and openings containing penetrating sleeves, piping, ductwork, and other items, requiring firestopping.
- B. Apply primer where recommended by manufacturer for type of firestopping material and substrate involved, and as required for compliance with required fire ratings.
- C. Apply firestopping material in sufficient thickness to achieve required fire and smoke rating.

3.09 FIELD QUALITY CONTROL

- A. Section 01 70 00 - Execution and Closeout Requirements: Field inspecting, testing, adjusting, and balancing.
- B. Inspect installed firestopping for compliance with specifications and submitted schedule.

3.10 CLEANING

- A. Section 01 70 00 - Execution and Closeout Requirements: Requirements for cleaning.
- B. Clean adjacent surfaces of firestopping materials.

3.11 PROTECTION OF FINISHED WORK

- A. Section 01 70 00 - Execution and Closeout Requirements: Requirements for protecting finished Work.
- B. Protect adjacent surfaces from damage by material installation.

3.12 SCHEDULESPIPE HANGER SPACING

<u>PIPE SIZE</u>	<u>MAX. HANGER SPACING</u>	<u>HANGER ROD DIAMETER</u>
Inches (mm)	Feet (m)	Inches (mm)
1/2 (12)	7 (2.1)	3/8 (9)
3/4 (20)	7 (2.1)	3/8 (9)
1 (25)	7 (2.1)	3/8 (9)
1-1/4 (32)	7 (2.1)	3/8 (9)
1-1/2 (38)	9 (2.7)	3/8 (9)
2 (50)	10 (3)	3/8 (9)
2-1/2 (65)	11 (3.4)	1/2 (13)
3 (75)	12 (3.7)	1/2 (13)
4 (100)	14 (4.3)	5/8 (15)
5 (125)	16 (4.9)	5/8 (15)
6 (150)	17 (5.2)	3/4 (19)
PVC (All Sizes)	6 (1.8)	3/8 (9)
C.I. Bell and Spigot (or No-Hub) And at Joints	5 (1.5)	5/8 (15)

END OF SECTION

SECTION 23 05 48

VIBRATION ISOLATION

PART 1 GENERAL

1.01 SUMMARY

- A. Scope: The extent of vibration isolation work to be provided under this Contract is covered by the requirements of this Section, Section 23 03 01, "Mechanical Basic Requirements," and the Contract Drawings including structural, architectural, mechanical and electrical which identify equipment and systems requiring vibration isolation treatment.

- B. Types: Types of vibration isolation equipment and systems specified in this Section include:

TYPE	DESCRIPTION
1I Isolator	Ribbed Neoprene Pads
2I Isolator	Neoprene-In-Shear Type
2H Hanger	Rubber-In-Shear Type
3I Isolator	Open Spring Type
3H Hanger	Combination Spring and Neoprene Type
4 Isolator	Vertically Restrained Spring Isolators
5 Thrust	Restraints Spring Type Installed in Pairs
A Base	Directly Bolted Attachment
B Base	Structural Rails or Bases
C Base	Concrete Inertia Type

- C. Selection of Isolators: Provide isolators selected by a vibration isolator equipment specialist.
1. Conform to isolator types herein specified.
 2. Examine the contract drawings for sizes, equipment power ratings, rotational speeds, equipment location, length of span between columns and beams and construction type to determine the isolator selection type and deflection required for each piece of mechanical equipment.
 3. Conform to the requirements of the American Society of Heating, Refrigerating, and Air-Conditioning Engineers (ASHRAE) Handbook, "HVAC Systems and Applications," Chapter 42, "Sound and Vibration Control."

1.02 QUALITY ASSURANCE

- A. Codes: Conform to the ASHRAE Handbook, "HVAC Systems and Applications," Chapter 42.
- B. Manufacturer: Isolators of the same type shall be the product of the same manufacturer. The manufacturer shall publish and maintain a full line of materials, engineering and application data and operating and maintenance instructions.

1.03 SUBMITTALS

- A. Contractor's Certification: Vibration isolator submittals shall include a certification, signed by an officer representing the Contractor and stipulating that the submittal prepared by the manufacturer has been reviewed, and checked on an item by item basis against each piece of mechanical equipment, shown or specified in the Contract Documents, which requires vibration isolation.
- B. Manufacturer's Certification: The manufacturer shall certify that the selections of vibration isolation equipment are based upon the drawings and specifications, and that each piece of

mechanical equipment has been examined for rotational speed, equipment type, mounting location, and supporting span between column centers, and that an appropriate isolator has been selected.

- C. Product Data: Furnish manufacturer's product data covering each isolator type for style, characteristic, and finish.
- D. Isolator quantities, dimensions, deflections, capacities and types shall remain the responsibility of the manufacturer and the Contractor.

1.04 STORAGE AND PROTECTION

- A. Storage: Store vibration isolation equipment indoors in the manufacturer's original shipping containers. Preclude the entrance of construction dirt and debris.
- B. Vibration isolation equipment and bases, which show signs of rust, cement or concrete fouling, dirt and construction debris shall be disassembled and cleaned, approved or removed from the project site and replaced with new.

PART 2 PRODUCTS

2.01 MANUFACTURERS

- A. Isolation equipment shall be the products of a single manufacturer.
- B. Equipment by Mason Industries, Kinetics Noise Control, Industrial Acoustic Control Company or Amber/Booth Company will be considered for approval.

2.02 EQUIPMENT

- A. Selection: Exact mounting sizes, dimensions and quantity of isolators and static deflection required shall be determined by the isolator manufacturer based upon equipment that will be furnished and installed by the Contractor under this Contract.
 1. Vibration isolation specialist shall coordinate his work with that of other trades to verify that equipment speeds, in revolutions per minute (rpm), are based upon actual equipment installed at the project site.
 2. Verify that equipment rpm and spring deflection selected are arranged so that resonance is avoided.
 3. All isolators used outdoors shall be hot dipped galvanized.

2.03 ISOLATOR TYPES

- A. Type 11 Isolators: Provide pad type vibration isolators consisting of either two layers ¼ inch thick elastomer, molded to contain a pattern with non-slip characteristics in all directions, and bonded to galvanized steel separator plates, or one inch thick precompressed molded fiberglass isolation pads. Minimum overall thickness shall be one inch. Deflection shall be limited to .025 inches or less. Loading shall not exceed 40 psi.
- B. Type 21 Isolators: Provide double rubber-in-shear or elastomer-in-shear with molded-in steel reinforcement in the top and bottom portions.
 1. Deflections shall be limited to ½ inch or less.
 2. Steel bases shall be drilled with mounting holes and equipment mounting points shall be threaded male or female connections.
 3. Treat resilient material with antiozone and antioxidant additives.

- C. Type 2H Hangers: Provide rubber-in-compression suspension hangers, consisting of a formed steel frame and elastomer isolation element and provided with attachments for top and bottom suspension rods.
 1. Design for a minimum 200 percent overload without noticeable deformation or failure.
 2. Design for minimum 30 degrees misalignment without binding or reducing the efficiency of the hanger.
 3. Metal components shall be galvanized and factory painted.

- D. Type 3I Isolators: Provide adjustable, freestanding, open spring isolators with combination leveling and equipment fastening bases.
 1. Spring elements shall be contained in upper and lower housing assemblies and shall have a minimum Kx-Ky of 0.75.
 2. Design springs for a minimum travel of 50 percent beyond the rated load.
 3. When fully compressed and "bottomed-out", isolators shall be capable of supporting a 200 percent overload without deformation and spring failure.
 4. A minimum ¼ inch thick non-skid isolation pad shall be bonded to the underside of the base plate.
 5. Size base plates to limit floor loading to 100 psi.
 6. Drill base plates for bolting.
 7. Provide means for anchoring the top element of the isolator to rails and equipment.

- E. Type 3H Hangers: Provide combination spring and elastomer hangers consisting of a formed steel frame with coil spring and elastomer insert in compression.
 1. Design hangers to be capable of supporting a 200 percent overload without noticeable deformation or failure.
 2. Design hangers to allow 30 degrees misalignment without binding or a reduction in hanger efficiency.
 3. Design hangers for connection to equipment and supporting rods.

- F. Type 4 Isolators: Provide vertically restrained, freestanding, laterally stable, open spring type isolators.
 1. Design for deflection exceeding ½ inch.
 2. Provide built-in bearing and leveling provisions.
 3. Provide a non-slip elastomer vibration absorbing pad bonded to the underside of the isolator base.
 4. Outside diameter of each spring shall be equal to or greater than 0.9 times the operating height of the spring under rated load.
 5. Provide vertical limit stops to prevent hyperextension due to wind loads or upward movement when the load is removed. Limit stops shall not bind or inhibit spring movement during normal operating ranges.

- G. Type 5 Thrust Restraints: Provide spring isolators of an adjustable, freestanding type enclosed within tubular mountings and arranged to be installed in pairs across the discharge of fan flexible connectors.
 1. Design restraints to resist the thrust caused by duct internal air pressure.
 2. Install restraints on duct systems with an internal static pressure exceeding 3 inches H₂O.
 3. Restraints shall have the same deflection as isolators installed under the fans.

2.04 BASE TYPES

- A. Type A Bases: No supplementary base is required. Vibration isolators, specified elsewhere, shall be attached directly to the supported equipment or structural system.

- B. Type B, Structural Rails or Bases: Provide bases designed and supplied by the isolation

equipment manufacturer.

1. Construct bases of mill rolled structural sections of sufficient dimension to limit the midpoint deflection or unsupported spans to 1/1440th of the span between isolators.
2. Include equipment static loadings, power transmission, component misalignment and cantilever loadings when designing structural sections.
3. When head room is limited, coordinate the design of structural rails and isolators to reduce mounting heights.
4. Factory finish with two coats equipment enamel.

C. Type C, Concrete Inertia Bases: Provide concrete inertia bases designed by the isolator manufacturer and arranged to be filled with concrete in the field.

1. Construct base of mill rolled structural steel sections, factory mitered and welded into a rigid frame and supporting No. 4 reinforcing bars welded to the structural frame 8 inches on centers both ways and located 2 inches from the bottom of the block.
2. Arrange for outrigger isolation mountings, anchor bolts and equipment support.
3. Field fill with 3000 psi cured-strength concrete. Trowel to a smooth hard finish.
4. Clean structural steel of excess concrete and field paint all steel elements with two coats equipment enamel.
5. Configuration of inertia bases shall be rectangular to accommodate equipment supported unless otherwise indicated.
6. Minimum thickness of inertia bases, in addition to providing suitable mass, shall be sufficient to provide stiffness to maintain equipment manufacturer's recommended alignment and duty efficiency of power transmission.
7. Minimum thickness shall be sufficient to result in a base deflection at midpoint of unsupported span of not more than 1/1440th of the span between isolators.
8. Minimum thickness shall be 8 percent of the longest base dimension unless otherwise specified or indicated.
9. For centrifugal pumps, the bases shall be a minimum 12 inches thick.
10. Where inertia bases are used to mount pumps, the bases shall be long enough to support piping elbows for all connections. All horizontal pumps shall include inertia bases as detailed in Drawings.

2.05 PIPING AND DUCTWORK

- A. General: All piping 1 inch diameter and larger in mechanical equipment rooms and to points ten feet away from the extremity of mechanical equipment rooms, shall be isolated from the building structure with flexible vibration isolators.
 1. Suspend piping on Type 3H hangers.
 2. Floor-mounted piping shall be supported with Type 3I spring isolators with deflections the same as the equipment to which the piping is attached.
- B. Reciprocating Equipment: Provide spring type hangers with deflections equal to that of reciprocating equipment, with piping arranged with offset elbows to absorb vibration.
- C. Risers: Pipe and duct risers within 10 feet of mechanical equipment rooms shall be resiliently anchored to the building structure with Type 1 vibration isolators, near the midpoint of the risers.
 1. Risers shall be isolated and supported at each second floor with pairs of Type 3H hangers, having deflections a minimum of 5 times the anticipated thermal movement at the support point.
 2. Risers shall be guided as required with four sets of Type 3I vibration isolators.
 3. Provide flexible neoprene or canvas connectors as specified in sheet metal ductwork at the connection point to all air moving equipment.
 4. Support ductwork with an internal pressure exceeding 3 inches H₂O with Type 3H hangers on maximum 10 feet centers with deflections equal to the equipment isolators.

2.06 VIBRATION ISOLATION SYSTEM SELECTION

- A. General: The following selections of vibration isolation equipment systems shall be considered as a minimum. For the equipment below, the following code applies:
 Letter (i.e. A, B, C) = Base type
 Number (i.e. 1, 2, 3, 4) = Isolator type
 Decimal number (i.e. 0.005, 0.01, etc.) = Minimum deflection (in inches)

- B. Low-Pressure AHU Locations (to 3 inches H₂O)

TYPE EQUIPMENT	ON GRADE SPAN	20'-30' FLOOR SPAN	30'-40' FLOOR SPAN	Over 40' FLOOR
Through 10 HP	A 2 0.75	A 3 1.0	A 3 1.0	A 3 1.0
10 HP and over	A 2 1.5	A 2 1.5	A 3 1.5	A 3 2.5
250 to 500 RPM over 500 RPM	A 2 1.5	A 3 1.5	A 3 1.5	A 3 1.5

- C. Centrifugal Pumps:

TYPE EQUIPMENT	ON GRADE INDOORS	ON GRADE OUTDOORS
Base-Mounted through 40 HP	C 3 3/4	I 2 1/4

- D. Air-Cooled Condensing and Roof Top Units:

TYPE EQUIPMENT	ON ROOF
through 5 tons	I 1 1/16
above 5 tons	I 2 1/4

- E. Provide vibration isolation on all Roof Top Units.

PART 3 EXECUTION

3.01 INSTALLATION

- A. Manufacturer: All vibration isolation equipment shall be installed in accordance with the manufacturer's recommendations.
- B. Manufacturer's Representative: The vibration isolation installation and deflection testing after equipment start-up shall be conducted by a representative of the manufacturer.

3.02 TESTS AND REPORTS

- A. Testing: Each vibration isolation device shall be deflection tested. Two copies of a bound report shall be submitted prior to final acceptance. The certification shall include the following:
 - 1. Certify that equipment has been isolated in accordance with Contract Drawings, specifications and submittals.
 - 2. Certify that all minimum specified deflections have been equaled or exceeded.

3.03 ANCHORING

- A. Installation: Installation shall comply with manufacturer's published recommendations and shall be installed so that isolators are plumb and are operating at a manner for which they were designed.
 - 1. Unless otherwise specified, all equipment shall be securely bolted to isolators, steel bases or concrete inertia bases.
 - 2. Indoor vibration isolators need not be attached to the structure unless required by local codes.
 - 3. Isolators installed outdoors shall be attached to building structure.

3.04 CLEANING

- A. Debris: Remove all debris from under equipment, and thoroughly clean steel bases, inertia bases and check for free movement.
- B. Adjustment: Adjust isolators as required for proper operation prior to starting equipment. Testing of vibration isolators shall be performed by a certified representative of the manufacturer as specified.

END OF SECTION

SECTION 23 05 93

TESTING, ADJUSTING, AND BALANCING

PART 1 GENERAL

1.01 SUMMARY

- A. Section Includes:
 - 1. Testing adjusting, and balancing of air systems.
 - 2. Measurement of final operating condition of HVAC systems.
 - 3. Sound measurement of equipment operating conditions.

- B. Contractor shall provide complete testing and balancing by an independent agency and submit a complete certified report. Owner, at their expense, may provide additional independent testing and balancing for monitoring and verification purposes of the Contractor's submitted report and compliance with the Contract Documents. The Contractor shall make all corrections and/or deficiencies required by both reports, Owner inspections and Engineer's review of reports and site inspections.

1.02 REFERENCES

- A. Associated Air Balance Council:
 - 1. AABC MN-1 - National Standards for Testing and Balancing Heating, Ventilating, and Air Conditioning Systems.

- B. American Society of Heating, Refrigerating and Air-Conditioning Engineers:
 - 1. ASHRAE 111 - Practices for Measurement, Testing, Adjusting and Balancing of Building Heating, Ventilation, Air-Conditioning and Refrigeration Systems.

- C. Natural Environmental Balancing Bureau:
 - 1. NEBB - Procedural Standards for Testing, Adjusting, and Balancing of Environmental Systems.

1.03 SUBMITTALS

- A. Division 01 - Submittal Procedures: Submittal procedures.

- B. Prior to commencing Work, submit proof of latest calibration date of each instrument.

- C. Test Reports: Indicate data on forms containing information indicated in Schedules.

- D. Field Reports: Indicate deficiencies preventing proper testing, adjusting, and balancing of systems and equipment to achieve specified performance.

- E. Prior to commencing Work, submit report forms or outlines indicating adjusting, balancing, and equipment data required. Include detailed procedures, agenda, sample report forms.

- F. Submit draft copies of report for review prior to final acceptance of Project.

- G. Furnish reports in soft cover, letter size, 3-ring binder manuals, complete with table of contents page and indexing tabs, with cover identification at front and side. Include set of reduced drawings with air outlets and equipment identified to correspond with data sheets, and indicating thermostat locations.

1.04 CLOSEOUT SUBMITTALS

- A. Division 01 - Execution Requirements: Closeout procedures.
- B. Project Record Documents: Record actual locations of flow measuring stations and balancing valves and rough setting.
- C. Operation and Maintenance Data: Furnish final copy of testing, adjusting, and balancing report inclusion in operating and maintenance manuals.

1.05 QUALITY ASSURANCE

- A. Perform Work in accordance with AABC MN-1 National Standards for Field Measurement and Instrumentation, Total System Balance, ASHRAE 111, NEBB Procedural Standards for Testing, Balancing and Adjusting of Environmental Systems.
- B. Maintain one copy of each document on site.
- C. Prior to commencing Work, calibrate each instrument to be used. Upon completing Work, recalibrate each instrument to assure reliability.

1.06 QUALIFICATIONS

- A. Test and Balance services for HVAC shall be provided by Agency employed by Mechanical or General Contractor and shall meet all requirements of the Florida Building Code and testing approved agency providing certification.
- B. Perform work under supervision of AABC Certified Test and Balance Engineer or NEBB Certified Testing, Balancing and Adjusting Supervisor.
- C. All reports shall be signed and sealed by a Professional Engineer that has reviewed and spot inspected all systems and witness testing of a minimum of 5% of the data measurement in the report on a per system basis.

1.07 PRE-INSTALLATION MEETINGS

- A. Division 01 - Administrative Requirements: Pre-installation meeting.
- B. Convene minimum one week prior to commencing work of this section.

1.08 SEQUENCING

- A. Division 01 - Summary: Work sequence.
- B. Sequence balancing between completion of systems tested and Date of Substantial Completion.

1.09 SCHEDULING

- A. Division 1 - Administrative Requirements: Coordination and project conditions.
- B. Schedule and provide assistance in final adjustment and test of smoke control system with Fire Authority.

PART 2 PRODUCTS

Not Used.

PART 3 EXECUTION**3.01 EXAMINATION**

- A. Division 01 - Administrative Requirements: Coordination and project conditions.
- B. Verify systems are complete and operable before commencing work. Verify the following:
 - 1. Systems are started and operating in safe and normal condition.
 - 2. Temperature control systems are installed complete and operable.
 - 3. Proper thermal overload protection is in place for electrical equipment.
 - 4. Final filters are clean and in place. If required, install temporary media in addition to final filters.
 - 5. Duct systems are clean of debris.
 - 6. Fans are rotating correctly.
 - 7. Fire and volume dampers are in place and open.
 - 8. Air coil fins are cleaned and combed.
 - 9. Access doors are closed and duct end caps are in place.
 - 10. Air outlets are installed and connected.
 - 11. Duct system leakage is minimized.
 - 12. Hydronic systems are flushed, filled, and vented. No leaking
 - 13. Pumps are rotating correctly.
 - 14. Proper strainer baskets are clean and in place or in normal position.
 - 15. Service and balancing valves are open.

3.02 PREPARATION

- A. Furnish instruments required for testing, adjusting, and balancing operations.
- B. Make instruments available to Architect/Engineer to facilitate spot checks during testing.

3.03 INSTALLATION TOLERANCES

- A. Air Handling Systems: Adjust to within plus or minus 10 percent of design.
- B. Air Outlets and Inlets: Adjust total to within plus 10 percent and minus 5 percent of design to space. Adjust outlets and inlets in space to within plus or minus 10 percent of design.
- C. Hydronic Systems: Adjust to within plus or minus 10 percent of design.

3.04 ADJUSTING

- A. Division 01 - Execution Requirements: Testing, adjusting, and balancing.
- B. Verify recorded data represents actual measured or observed conditions.
- C. Permanently mark settings of valves, dampers, and other adjustment devices allowing settings to be restored. Set and lock memory stops.

- D. After adjustment, take measurements to verify balance has not been disrupted. If disrupted, verify correcting adjustments have been made.
- E. Report defects and deficiencies noted during performance of services, preventing system balance.
- F. Leave systems in proper working order, replacing belt guards, closing access doors, closing doors to electrical switch boxes, and restoring thermostats to specified settings.
- G. At final inspection, recheck random selections of data recorded in report. Recheck points or areas as selected and witnessed by Owner.
- H. Check and adjust systems approximately six months after final acceptance and submit report.

3.05 AIR SYSTEM PROCEDURE

- A. Adjust air handling and distribution systems to obtain required or design supply, return, and exhaust air quantities.
- B. Make air quantity measurements in main ducts by Pitot tube traverse of entire cross sectional area of duct.
- C. Measure air quantities at air inlets and outlets.
- D. Adjust distribution system to obtain uniform space temperatures free from objectionable drafts.
- E. Use volume control devices to regulate air quantities only to extent adjustments do not create objectionable air motion or sound levels. Effect volume control by using volume dampers located in ducts.
- F. Vary total system air quantities by adjustment of fan speeds. Provide sheave drive changes to vary fan speed. Vary branch air quantities by damper regulation.
- G. Provide system schematic with required and actual air quantities recorded at each outlet or inlet.
- H. Measure static air pressure conditions on air supply units, including filter and coil pressure drops, and total pressure across fan. Make allowances for 50 percent loading of filters.
- I. Adjust outside air automatic dampers, outside air, return air, and exhaust dampers for design conditions.
- J. Measure temperature conditions across outside air, return air, and exhaust dampers to check leakage.
- K. At modulating damper locations, take measurements and balance at extreme conditions. Balance variable volume systems at maximum airflow rate, full cooling, and at minimum airflow rate, full heating.
- L. Measure building static pressure and adjust supply, return, and exhaust air systems to obtain required relationship between each to maintain approximately 0.08 inches positive static pressure near building entries. Reset barometric relief counterweight for required static pressure in buildings as required.

- M. Check multi-zone units for motorized damper leakage. Adjust air quantities with mixing dampers set first for cooling, then heating, then modulating.
- N. For variable air volume system powered units set volume controller to airflow setting indicated. Confirm connections properly made and confirm proper operation for automatic variable-air-volume temperature control.
- O. On fan powered VAV boxes, adjust airflow switches for proper operation.

3.06 SCHEDULES

- A. Equipment Requiring Testing, Adjusting, and Balancing:
 - 1. Plumbing Pumps.
 - 2. Air Cooled Refrigerant Condensers.
 - 3. Roof Top Air Handling Units.
 - 4. Fans.
 - 5. Air Filters.
 - 6. Air Inlets and Outlets.
 - 7. Dust Collection Air System.
- B. Report Forms
 - 1. Title Page:
 - a. Name of Testing, Adjusting, and Balancing Agency
 - b. Address of Testing, Adjusting, and Balancing Agency
 - c. Telephone and facsimile numbers of Testing, Adjusting, and Balancing Agency
 - d. Project name
 - e. Project location
 - f. Project Architect
 - g. Project Engineer
 - h. Project Contractor
 - i. Project altitude
 - j. Report date
 - 2. Summary Comments:
 - a. Design versus final performance
 - b. Notable characteristics of system
 - c. Description of systems operation sequence
 - d. Summary of outdoor and exhaust flows to indicate building pressurization
 - e. Nomenclature used throughout report
 - f. Test conditions
 - 3. Instrument List:
 - a. Instrument
 - b. Manufacturer
 - c. Model number
 - d. Serial number
 - e. Range
 - f. Calibration date
 - 4. Electric Motors:
 - a. Manufacturer
 - b. Model/Frame
 - c. HP/BHP and kW
 - d. Phase, voltage, amperage; nameplate, actual, no load
 - e. RPM
 - f. Service factor

- g. Starter size, rating, heater elements
- h. Sheave Make/Size/Bore
- 5. V-Belt Drive:
 - a. Identification/location
 - b. Required driven RPM
 - c. Driven sheave, diameter and RPM
 - d. Belt, size and quantity
 - e. Motor sheave diameter and RPM
 - f. Center to center distance, maximum, minimum, and actual
- 6. Pump Data:
 - a. Identification/number
 - b. Manufacturer
 - c. Size/model
 - d. Impeller
 - e. Service
 - f. Design flow rate, pressure drop, BHP and kW
 - g. Actual flow rate, pressure drop, BHP and kW
 - h. Discharge pressure
 - i. Suction pressure
 - j. Total operating head pressure
 - k. Shut off, discharge and suction pressures
 - l. Shut off, total head pressure
- 7. Air Cooled Condenser:
 - a. Identification/number
 - b. Location
 - c. Manufacturer
 - d. Model number
 - e. Serial number
 - f. Entering DB air temperature, design and actual
 - g. Leaving DB air temperature, design and actual
 - h. Number of compressors
- 8. Cooling or Heating Coil Data:
 - a. Identification/number
 - b. Location
 - c. Service
 - d. Manufacturer
 - e. Air flow, design and actual
 - f. Entering air DB temperature, design and actual
 - g. Entering air WB temperature, design and actual
 - h. Leaving air DB temperature, design and actual
 - i. Leaving air WB temperature, design and actual
 - j. Water flow, design and actual
 - k. Water pressure drop, design and actual
 - l. Entering water temperature, design and actual
 - m. Leaving water temperature, design and actual
 - n. Saturated suction temperature, design and actual
 - o. Air pressure drop, design and actual
- 9. Air Moving Equipment:
 - a. Location
 - b. Manufacturer
 - c. Model number
 - d. Serial number
 - e. Arrangement/Class/Discharge
 - f. Air flow, specified and actual
 - g. Return air flow, specified and actual

- h. Outside air flow, specified and actual
 - i. Total static pressure (total external), specified and actual
 - j. Inlet pressure
 - k. Discharge pressure
 - l. Sheave Make/Size/Bore
 - m. Number of Belts/Make/Size
 - n. Fan RPM
10. Return Air/Outside Air Data:
- a. Identification/location
 - b. Design air flow
 - c. Actual air flow
 - d. Design return air flow
 - e. Actual return air flow
 - f. Design outside air flow
 - g. Actual outside air flow
 - h. Return air temperature
 - i. Outside air temperature
 - j. Required mixed air temperature
 - k. Actual mixed air temperature
 - l. Design outside/return air ratio
 - m. Actual outside/return air ratio
11. Exhaust Fan Data:
- a. Location
 - b. Manufacturer
 - c. Model number
 - d. Serial number
 - e. Air flow, specified and actual
 - f. Total static pressure (total external), specified and actual
 - g. Inlet pressure
 - h. Discharge pressure
 - i. Sheave Make/Size/Bore
 - j. Number of Belts/Make/Size
 - k. Fan RPM
12. Duct Traverse:
- a. System zone/branch
 - b. Duct size
 - c. Area
 - d. Design velocity
 - e. Design air flow
 - f. Test velocity
 - g. Test air flow
 - h. Duct static pressure
 - i. Air temperature
 - j. Air correction factor
13. Air Distribution Test Sheet:
- a. Air terminal number
 - b. Room number/location
 - c. Terminal type
 - d. Terminal size
 - e. Area factor
 - f. Design velocity
 - g. Design air flow
 - h. Test (final) velocity
 - i. Test (final) air flow
 - j. Percent of design air flow

14. Sound Level Report:
 - a. Location
 - b. Octave bands - equipment off
 - c. Octave bands - equipment on
 - d. RC level - equipment on

15.

END OF SECTION

SECTION 23 07 00

MECHANICAL INSULATION

PART 1 GENERAL

1.01 SUMMARY

- A. Section Includes:
1. Ductwork insulation.
 2. Duct liner.
 3. Insulation jackets.
 4. Equipment insulation
 5. Piping system insulation.
 6. Insulation accessories including vapor retarders, jackets, and accessories.
- B. Related Sections:
1. Section 07 84 00- Firestopping: Product requirements for firestopping for placement by this section.
 2. Section 09 90 00 - Paint and Coating: Execution requirements for painting insulation jackets and covering specified by this section.
 3. Section 23 05 29 - Supports and Anchors: Product and Execution requirements for inserts at hanger locations.
 4. Section 23 25 03 - Mechanical Identification: Product requirements for mechanical identification.

1.02 REFERENCES

- A. ASTM International:
1. ASTM A167 - Standard Specification for Stainless and Heat-Resisting Chromium-Nickel Steel Plate, Sheet, and Strip.
 2. ASTM B209 - Standard Specification for Aluminum and Aluminum-Alloy Sheet and Plate.
 3. ASTM B209M - Standard Specification for Aluminum and Aluminum-Alloy Sheet and Plate (Metric).
 4. ASTM C177 - Standard Test Method for Steady-State Heat Flux Measurements and Thermal Transmission Properties by Means of the Guarded-Hot-Plate Apparatus.
 5. ASTM C195 - Standard Specification for Mineral Fiber Thermal Insulating Cement.
 6. ASTM C449/C449M - Standard Specification for Mineral Fiber Hydraulic-Setting Thermal Insulating and Finishing Cement.
 7. ASTM C518 - Standard Test Method for Steady-State Heat Flux Measurements and Thermal Transmission Properties by Means of the Heat Flow Meter Apparatus.
 8. ASTM C533 - Standard Specification for Calcium Silicate Block and Pipe Thermal Insulation.
 9. ASTM C534 - Standard Specification for Preformed Flexible Elastomeric Cellular Thermal Insulation in Sheet and Tubular Form.
 10. ASTM C547 - Standard Specification for Mineral Fiber Pipe Insulation.
 11. ASTM C552 - Standard Specification for Cellular Glass Thermal Insulation.
 12. ASTM C553 - Standard Specification for Mineral Fiber Blanket Thermal Insulation for Commercial and Industrial Applications.
 13. ASTM C591 - Standard Specification for Unfaced Preformed Rigid Cellular Polyisocyanurate Thermal Insulation.
 14. ASTM C592 - Standard Specification for Mineral Fiber Blanket Insulation and Blanket-Type Pipe Insulation (Metal-Mesh Covered) (Industrial Type).
 15. ASTM C610 - Standard Specification for Molded Expanded Perlite Block and Pipe Thermal Insulation.

16. ASTM C612 - Standard Specification for Mineral Fiber Block and Board Thermal Insulation.
 17. ASTM C795 - Standard Specification for Thermal Insulation for Use in Contact with Austenitic Stainless Steel.
 18. ASTM C921 - Standard Practice for Determining the Properties of Jacketing Materials for Thermal Insulation.
 19. ASTM C1071 - Standard Specification for Thermal and Acoustical Insulation (Glass Fiber, Duct Lining Material).
 20. ASTM C1126 - Standard Specification for Faced or Unfaced Rigid Cellular Phenolic Thermal Insulation.
 21. ASTM C1136 - Standard Specification for Flexible, Low Permeance Vapor Retarders for Thermal Insulation.
 22. ASTM C1290 - Standard Specification for Flexible Fibrous Glass Blanket Insulation Used to Externally Insulate HVAC Ducts.
 23. ASTM D1784 - Standard Specification for Rigid Poly (Vinyl Chloride) (PVC) Compounds and Chlorinated Poly (Vinyl Chloride) (CPVC) Compounds.
 24. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials.
 25. ASTM E96 - Standard Test Methods for Water Vapor Transmission of Materials.
 26. ASTM E162 - Standard Test Method for Surface Flammability of Materials Using a Radiant Heat Energy Source.
 27. ASTM G21 - Standard Practice for Determining Resistance of Synthetic Polymeric Materials to Fungi.
- B. Sheet Metal and Air Conditioning Contractors':
1. SMACNA - HVAC Duct Construction Standard - Metal and Flexible.

1.03 SUBMITTALS

- A. Section 01 33 00 - Submittal Procedures: Submittal procedures.
- B. Product Data: Submit product description, thermal characteristics and list of materials and thickness for each service, and location.
- C. Manufacturer's Installation Instructions: Submit manufacturers published literature indicating proper installation procedures.
- D. Manufacturer's Certificate: Certify products meet or exceed specified requirements.

1.04 QUALIFICATIONS

- A. Manufacturer: Company specializing in manufacturing products specified in this section with minimum three years experience.
- B. Applicator: Company specializing in performing Work of this section with minimum three years experience.

1.05 DELIVERY, STORAGE, AND HANDLING

- A. Section 01 60 00 - Product Requirements: Requirements for transporting, handling, storing, and protecting products.
- B. Accept materials on site in original factory packaging, labeled with manufacturer's identification, including product density and thickness.

- C. Protect insulation from weather and construction traffic, dirt, water, chemical, and mechanical damage, by storing in original wrapping.

1.06 ENVIRONMENTAL REQUIREMENTS

- A. Section 01 60 00 - Product Requirements: Environmental conditions affecting products on site.
- B. Install insulation only when ambient temperature and humidity conditions are within range recommended by manufacturer.
- C. Maintain temperature during and after installation for minimum period of 24 hours.

1.07 FIELD MEASUREMENTS

- A. Verify field measurements prior to fabrication of ductwork or cutting of insulation.

1.08 WARRANTY

- A. Section 01 70 00 - Execution and Closeout Requirements: Product warranties and product bonds.
- B. Furnish five year manufacturer warranty for man made fiber.

PART 2 PRODUCTS

2.01 MAN MADE MINERAL FIBER

- A. Insulation: ASTM C547 Mineral Fiber Pre-molded Pipe Insulation, Type I, 850 degrees F (454 degrees C).
- B. Insulation: ASTM C795; semi-rigid, noncombustible, end grain adhered to jacket.
 1. 'K' ('ksi') factor: ASTM C177, 0.24 at 75 degrees F.
 2. Maximum service temperature: 650 degrees F.
 3. Maximum moisture absorption: 0.2 percent by volume.
- C. Vapor Retarder Jacket:
 1. ASTM C921, White Kraft paper with glass fiber yarn, bonded to aluminized film.
 2. Moisture vapor transmission: ASTM E96; 0.02 perm-inches.
- D. Tie Wire: 0.048 inch (1.22 mm) stainless steel with twisted ends on maximum 12 inch (300 mm) centers.

2.02 GLASS FIBER, FLEXIBLE

- A. Insulation: ASTM C553; flexible, noncombustible blanket.
 1. 'K' ('Ksi') value : ASTM C518, 0.31 at 75 degrees F.
 2. Maximum service temperature: 250 degrees F.
 3. Maximum moisture absorption: 0.20 percent by volume.
 4. 2 inch thick 3/4 lb. density minimum.
- B. Vapor Barrier Jacket:
 1. Kraft paper with glass fiber yarn and bonded to aluminized film.
 2. Moisture vapor transmission: ASTM E96; 0.02 perm.
 3. Secure with pressure sensitive tape.

- C. Vapor Barrier Tape:
 1. Kraft paper reinforced with glass fiber yarn and bonded to aluminized film, with pressure sensitive rubber based adhesive. To be sealed with fabric weave embedded with mastic sealant.
 2. Must be mastic sealed over all tape.
- D. Vapor Barrier Mastic (on all Insulation Joints)
 1. Vinyl emulsion type acrylic or mastic, compatible with insulation, white color.
- E. Tie Wire: Annealed stainless steel, 18 gage.

2.03 MAN MADE MINERAL FIBER, FLEXIBLE BLANKET OR BATTS

- A. Insulation: ASTM C1290; Mineral Fiber Blanket Thermal Insulation for Commercial and Industrial Applications.
 1. Operating Temperatures: 250 degrees F (121 degrees C).
 2. Density: 0.75 lb/cu ft (12 kg/cu m), 2 inch thickness minimum.
 3. 'K' ('ksi') factor: ASTM C518, 0.30 at 75 degrees F.
- B. Vapor Retarder Jacket: ASTM 1136, Type II Flexible and Low Permeance Vapor Retarders for Thermal Insulation.
 1. For systems operating at temperatures below ambient, close and secure seams and joints. When outward clinching staples are used, seal penetrations.
- C. Tie Wire: 0.048 inch (1.22 mm) stainless steel with twisted ends on maximum 12 inch (300 mm) centers.
- D. Vapor Retarder Lap Adhesive:
 1. Compatible with insulation.
- E. Insulating Cement/Mastic:
 1. ASTM C195; hydraulic setting on mineral wool.

2.04 MINERAL FIBER, FLEXIBLE

- A. Insulation: ASTM C553 Mineral Fiber Blanket Thermal Insulation for Commercial and Industrial Applications, Type II.
- B. Vapor Retarder Jacket:
 1. Kraft paper with glass fiber yarn and bonded to aluminized film.
 2. Moisture vapor transmission: ASTM E96; 0.02 perm.
 3. Secure with pressure sensitive tape, fiber mesh embedded with mastic on all seams and joints over taping.
- C. Vapor Retarder Tape:
 1. Kraft paper reinforced with glass fiber yarn and bonded to aluminized film, with pressure sensitive rubber based adhesive.
- D. Tie Wire: Annealed steel, 16 gage (1.5 mm).

2.05 GLASS FIBER, RIGID

- A. Insulation: ASTM C612 or ASTM C592; rigid, noncombustible.
 1. 'K' ('ksi') factor: ASTM C177 or ASTM C518, 0.24 at 75 degrees F.
 2. Maximum Service Temperature: 450 degrees F.

3. Maximum Moisture Absorption: 0.1 percent by volume.
4. Density: 3.0 ft.

- B. Vapor Retarder Jacket: ASTM C1136 Flexible, Low Permeance Vapor Retarders for Thermal Insulation, Type II.
- C. Facing: 1 inch (25 mm) stainless steel hexagonal wire mesh stitched on one face of insulation.
- D. Vapor Retarder Lap Adhesive:
 1. Compatible with insulation.
- E. Insulating Cement/Mastic:
 1. ASTM C195; hydraulic setting on mineral wool.

2.06 ELASTOMERIC CELLULAR FOAM (ON EXPOSED DUCTWORK ON ROOFS WITH ALUMINUM OUTER JACKET AND PRE-MOLDED ON CONDENSATE PIPING), LINER FOR SOUND IN DUCTWORK

- A. Preformed Flexible Elastomeric Cellular Thermal Insulation in Sheet and Tubular form: ASTM C534; Type I, Tubular form
- B. Elastomeric Foam Adhesive:
 1. Air dried, contact adhesive, compatible with insulation. 100% coverage required.
- C. Liner: Use elastomeric cellular foam in sheets of thickness specified for acoustical liner. Install smooth side towards air flow. 100% glued and pinned on 12" centers and 2" from edging on 6" centers.

2.07 PIPE INSULATION AND EQUIPMENT JACKETS

- A. PVC Plastic Pipe Jacket:
 1. Product Description: ASTM D1784, One piece molded type fitting covers and sheet material, off-white color.
 2. Thickness: 15 mil.
 3. Connections: Brush on welding adhesive or pressure sensitive color matching vinyl tape.
- B. PVC Plastic Equipment Jacket (Pumps, Tanks, Chiller Barrels, Valves):
 1. Product Description: Aluminum sheet material, off-white color.
 2. Minimum Service Temperature: -40 F.
 3. Maximum Service Temperature: 150 F.
 4. Moisture Vapor Transmission: ASTM E96; 0.002 perm-inches.
 5. Thickness: 15 mil.
 6. Connections: Brush on welding adhesive or pressure sensitive color matching vinyl tape.
- C. Covering Adhesive Mastic:
 1. Compatible with insulation, 100% glued on all contact surfaces.
- D. Canvas Equipment Jacket:
 1. UL listed.
 2. Fabric: 6 oz/sq yd (220 g/sq m), plain weave cotton.
 3. Fire retardant lagging adhesive. Composite of insulation, jacket and lagging adhesive having flame spread index not greater than 25 and smoke developed index not greater than 50 when tested to ASTM E84.

- E. Lagging Adhesive:
 1. Compatible with insulation.
- F. Aluminum Pipe Jacket:
 1. ASTM B209 and/or ASTM B209M.
 2. Thickness: 0.025 inch thick sheet.
 3. Finish: Embossed.
 4. Joining: Longitudinal slip joints and 2 inch (50 mm) laps minimum.
 5. Fittings: .025 inch thick die shaped fitting covers with factory attached protective liner.
 6. Metal Jacket Bands: 3/8 inch (10 mm) wide; 0.010 inch thick stainless steel.

2.08 GLASS FIBER

- A. Insulation: ASTM C547 and ASTM C795; rigid molded, noncombustible.
 1. 'K' ('Ksi') value: ASTM C177, 0.24 at 75 degrees F.
 2. Maximum service temperature: 850 degrees F.
 3. Maximum moisture absorption: 0.2 percent by volume.
- B. Insulation: ASTM C795; semi-rigid, noncombustible, end grain adhered to jacket.
 1. 'K' ('Ksi') value: ASTM C177, 0.24 at 75 degrees F (0.035 at 24 degrees C).
 2. Maximum service temperature: 650 degrees F (343 degrees C).
 3. Maximum moisture absorption: 0.2 percent by volume.
- C. Vapor Barrier Jacket:
 1. ASTM C921, White kraft paper with glass fiber yarn, bonded to aluminized film.
 2. Moisture vapor transmission: ASTM E96; 0.02 perm-inches.
- D. Tie Wire: 0.048 inch (1.22 mm) stainless steel with twisted ends on maximum 12 inch (300 mm) centers.
- E. Vapor Barrier Lap Adhesive:
 1. Compatible with insulation.
- F. Fibrous Glass Fabric:
 1. Cloth: Untreated; 9 oz/sq-yd (305 g/sq m) weight.
 2. Blanket: 1.0 lb/cu ft (16 kg/cu m) density.
 3. Weave: 5x5.
- G. Indoor Vapor Barrier Finish:
 1. Cloth: Untreated; 9 oz/sq yd (305 g/sq m) weight.
 2. Vinyl emulsion type acrylic, compatible with insulation, white color.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Section 01 30 00 - Administrative Requirements: Coordination and project conditions.
- B. Verify piping, equipment and ductwork has been tested before applying insulation materials.
- C. Verify surfaces are clean and dry, with foreign material removed.

3.02 INSTALLATION

- A. Exposed Piping: Locate insulation and cover seams in least visible locations.
- B. Insulated pipes conveying fluids below ambient temperature: Insulate entire system including fittings, valves, unions, flanges, strainers, flexible connections, pump bodies, and expansion joints. Provide premanufactured removable insulation assemblies on pumps, strainers and other equipment needing periodic maintenance.
- C. Man made mineral fiber insulated pipes conveying fluids below ambient temperature:
 - 1. Furnish factory-applied or field-applied vapor retarder jackets. Secure factory-applied jackets with pressure sensitive adhesive self-sealing longitudinal laps and butt strips. Secure field-applied jackets with outward clinch expanding staples and seal staple penetrations with vapor retarder mastic.
 - 2. Insulate fittings, joints, and valves with molded insulation of like material and thickness as adjacent pipe. Finish with glass cloth and vapor retarder adhesive or PVC fitting covers.
- D. For hot piping conveying fluids over 140 degrees F, insulate flanges and unions at equipment.
- E. Man made mineral fiber insulated pipes conveying fluids above ambient temperature:
 - 1. Furnish factory-applied or field-applied standard jackets. Secure with outward clinch expanding staples or pressure sensitive adhesive system on standard factory-applied jacket and butt strips or both.
 - 2. Insulate fittings, joints, and valves with insulation of like material and thickness as adjoining pipe. Finish with glass cloth and adhesive or PVC fitting covers in all exposed areas.
- F. Inserts and Shields:
 - 1. Application: Piping or Equipment 1-1/2 inches diameter or larger.
 - 2. Shields: Galvanized steel between pipe hangers or pipe hanger rolls and inserts.
 - 3. Insert location: Between support shield and piping and under finish jacket.
 - 4. Insert configuration: Minimum 6 inches (150 mm) long, of thickness and contour matching adjoining insulation; may be factory fabricated.
 - 5. Insert material: Compression resistant insulating material suitable for planned temperature range and service.
- G. Continue insulation through penetrations of building assemblies or portions of assemblies having fire resistance rating of one hour or less. Provide intumescent firestopping when continuing insulation through assembly. Finish at supports, protrusions, and interruptions. Refer to Section 07840 for penetrations of assemblies with fire resistance rating greater than one hour.
- H. Pipe Exposed in Mechanical Equipment Rooms or Finished Spaces: Finish with PVC jacket and fitting covers.
- I. Exterior Applications: Provide vapor retarder jacket. Insulate fittings, joints, and valves with insulation of like material and thickness as adjoining pipe, and finish with glass mesh reinforced vapor retarder cement. Cover with aluminum jacket with seams located at 3, 6 or 9 o'clock position on side of horizontal piping with overlap facing down to shed water or on bottom side of horizontal equipment.
- J. Factory Insulated Equipment: Do not insulate.
- K. Exposed Equipment, Tanks, Pumps, Valves: Locate insulation and cover seams in least visible locations. Cover with aluminum jacket protector.

- L. Apply insulation close to equipment by grooving, scoring, and beveling insulation. Fasten insulation to equipment with studs, pins, clips, adhesive, wires, or bands.
- M. Fill joints, cracks, seams, and depressions with bedding compound to form smooth surface. On cold equipment, use vapor retarder cement.
- N. Insulated equipment containing fluids below ambient temperature: Insulate entire system.
- O. For hot equipment containing fluids over 140 degrees F, insulate flanges and unions with removable sections and jackets.
- P. Mineral fiber insulated equipment containing fluids above ambient temperature: Provide standard jackets, with or without vapor retarder, factory-applied or field-applied. Finish with glass cloth and adhesive.
- Q. Finish insulation at supports, protrusions, and interruptions.
- R. Equipment in Mechanical Equipment Rooms or Finished Spaces: Finish with canvas jacket sized for finish painting on air handling units; PVC jacket and fitting covers or aluminum jacket on piping, tanks, pumps, etc.
- S. Nameplates and ASME Stamps: Bevel and seal insulation around; do not insulate over.
- T. Equipment Requiring Access for Maintenance, Repair, or Cleaning: Install insulation for easy removal and replacement without damage. Provide premanufactured assemblies specifically manufactured for such device and purpose.
- U. Insulated ductwork conveying air below ambient temperature:
 1. Provide insulation with vapor retarder jackets.
 2. Finish with tape and vapor retarder jacket and sealed with fiber mesh and sealer.
 3. Continue insulation through walls, sleeves, hangers, and other duct penetrations.
 4. Insulate entire system including fittings, joints, flanges, fire dampers, flexible connections, and expansion joints. Mastic all joints, seams and terminations with fiber mesh and sealant.
- V. Insulated ductwork conveying air above ambient temperature:
 1. Provide with standard vapor retarder jacket.
 2. Insulate fittings and joints. Where service access is required, bevel and seal ends of insulation.
- W. Ductwork Exposed in Mechanical Equipment Rooms or Finished Spaces: Finish with canvas jacket sized for finish painting or aluminum jacket. Insulation in Mechanical Rooms where exposed to be rigid with aluminum cover - mastic, taped, sealed all joints and seams.
- X. Exterior Applications: Provide insulation with vapor retarder jacket. Cover with with caulked aluminum jacket with seams located on bottom side of horizontal duct section.
- Y. External Duct Insulation Application:
 1. Secure insulation with vapor retarder with wires and seal jacket joints with vapor retarder adhesive or tape to match jacket.
 2. Secure insulation without vapor retarder with staples, tape, or wires.
 3. Install without sag on underside of ductwork. Use adhesive or mechanical fasteners where necessary to prevent sagging. Lift ductwork off trapeze hangers and insert spacers.
 4. Seal vapor retarder penetrations by mechanical fasteners with vapor retarder adhesive.
 5. Stop and point insulation around access doors and damper operators to allow operation without disturbing wrapping.

6. Provide outer covering of aluminum jacket that is mastic sealed at all joints.
- Z. Duct and Plenum Liner Application:
1. Adhere insulation with adhesive for 100 percent coverage.
 2. Secure insulation with mechanical liner fasteners. SMACNA Standards for spacing. Maximum spacing 12 inches on centers and 3 inches from corners and edges on 6" centers.
 3. Seal and smooth joints. Seal and coat transverse joints.
 4. Seal liner surface penetrations with adhesive.
 5. Duct dimensions indicated are net inside dimensions required for airflow. Increase duct size to allow for insulation thickness.

3.03 SCHEDULES

- A. Plumbing Systems:
1. Domestic Hot Water Supply:
 - a. Man Made Mineral Fiber Insulation:
 - 1) Pipe Size Range: All.
 - 2) Thickness: 1 inch.
 - b. Cellular Elastomeric Foam Insulation:
 - 1) Pipe Size Range: All.
 - 2) Thickness: 3/4 inch.
 2. Domestic Hot Water and Recirculation:
 - a. Man Made Mineral Fiber Insulation:
 - 1) Pipe Size Range: All sizes.
 - 2) Thickness: 1 inch.
 - b. Expanded Polyethylene Insulation:
 - 1) Pipe Size Range: All sizes.
 - 2) Thickness: 1 inch.
 - c. Cellular Foam Insulation:
 - 1) Pipe Size Range: All sizes.
 - 2) Thickness: 3/4 inch.
 3. Domestic Cold Water: 1 inch when exposed to freezing temperatures.
 4. Roof Drain Bodies: 1 inch.
 5. Roof Drainage Within 10 feet (3 Meters) of Exterior: 1 inch.
 6. Plumbing Vents Within 10 feet (3 Meters) of Exterior: 1 inch.
 7. Chilled Drinking Water Supply: 1 inch.
- B. Other Systems:
1. Piping Exposed to Freezing with Heat Tracing: 3 inch cellular with aluminum jacket.
 2. Tanks Exposed to Freezing with Heat Tracing: 3 inch cellular with aluminum jacket.
- C. Plumbing Systems:
1. Domestic Hot Water Storage Tanks:
 - a. Mineral Fiberboard Insulation: 3 inches thick.
 - b. Cellular Glass Insulation: 3 inch thick.
 - c. Cellular Foam Insulation: 1½ inches thick.
- D. Evaporative Condenser Intake and Exhaust:
1. Rigid Glass Fiber Ductwork Insulation: 1 inch (25 mm) thick.
- E. Exhaust Ducts Within 10 feet (3 m) of Exterior Openings: 2 inches.

- F. Exhaust Ducts Exposed to Outdoor Air: 2 inch.
- G. Outside Air Intake Ducts: 2 inch rigid.
- H. Plenums: 2 inch rigid.
- I. Plenums (Cooling System): 2 inch.
- J. Supply Ducts: 2 inch rigid in Mechanical Rooms with aluminum jacket or flexible blanket where concealed.
- K. Supply ducts After Terminal Boxes: 2 inch.
- L. Return and Relief Ducts in Mechanical Rooms: 2 inch rigid.
- M. Ducts Exposed to Outdoors: 3 inch cellular foam with aluminum jacket.

END OF SECTION

SECTION 23 22 13

CONDENSATE DRAIN PIPING

PART 1 GENERAL

1.01 SUMMARY

- A. Scope: Provide condensate drain piping from cooling coil drain pans. Drain piping shall be routed to the nearest roof drain except as otherwise indicated on the drawings.
- B. Related Sections: Refer to other Division 23 sections for the following:
 - 1. Mechanical Identification.
 - 2. Mechanical Insulation.
 - 3. Firestopping.
- C. Other Divisions: Refer to other Divisions of the specification for the following:
 - 1. Field Painting: Division 09.
 - 2. Piping systems requiring fixed locations and slopes shall have priority over those which do not have both requirements.

1.02 QUALITY ASSURANCE

- A. Codes and Standards: Provide piping and fittings conforming to the requirements of the following:
 - 1. American Society for Testing and Materials (ASTM):
 - a. B16.22 Standard Specification for Wrought Copper and Copper Alloy Solder Joint Pressure Fittings
 - b. B16.23 Standard Specification for Cast Solder Fittings
 - c. B16.29 Standard Specification for Wrought Solder Fittings
 - d. B88 Standard Specification for Seamless Copper Water Tube
 - e. B306 Standard Specification for Seamless Copper Waste and Vent Pipe

1.03 SUBMITTALS

- A. Division 01: Refer to "Submittals" for basic information relating to submittal requirements.
- B. Product Data: Submit manufacturer's standard technical product data indicating conformance to the stipulated reference specifications, construction materials, construction details, and test and operating pressures. Submit manufacturer's product data on the following:
 - 1. Pipe materials.

1.04 STORAGE AND PROTECTION

- A. Storage: Store piping on the project site so as to preclude the entrance of construction dirt and debris into the open ends of piping. Do not install piping fouled with construction dirt.
- B. Storage of Fittings: Store fittings under cover, protected from construction dirt and rain.

PART 2 PRODUCTS

2.01 PIPING MATERIALS

- A. Piping shall be copper type 'L' as specified.

PART 3 EXECUTION

3.01 GENERAL

- A. Piping shall be sloped uniformly toward roof drain and provided with trap seal having a depth, in inches, equivalent to the total static pressure of the respective fan system plus one inch minimum..
- B. Piping shall be installed in a neat and workmanlike manner and shall not be smaller than full size of the equipment drain connection or one-half inch (1/2") whichever is larger.
- C. Unless otherwise noted on Drawings, use copper type "K" for condensate line material.

3.02 INSTALLATION

- A. Sizes: Provide piping systems of sizes indicated on the drawings. Systems shall be installed complete.
- B. Codes: Install piping systems in conformance with all applicable codes.
- C. Pitch: Install condensate drain piping with a pitch or slope of not less than 1/8 inch per foot in the direction of flow.

3.03 ROUTING

- A. Unless otherwise indicated, route pipe discharge to the nearest hub drain.

END OF SECTION

SECTION 23 31 00

DUCTS

PART 1 GENERAL

1.01 SUMMARY

- A. Section Includes:
1. Duct Materials.
 2. Insulated flexible ducts.
 3. Single wall spiral round ducts.
 4. Ductwork fabrication.
 5. Duct cleaning.
- B. Related Sections:
1. Section 03 30 00 - Cast-In-Place Concrete: Product requirements for concrete for placement by this section.
 2. Section 09 90 00 - Paint and Coating: Execution requirements for Weld priming, weather resistant, paint or coating specified by this section.
 3. Section 11 40 00 - Food Service Equipment: Product requirements for kitchen range hoods for placement by this section.
 4. Section 23 05 29 - Supports and Anchors: Product requirements for hangers, supports and sleeves for placement by this section.
 5. Section 23 33 00 - Ductwork Accessories: Product requirements for duct accessories for placement by this section.

1.02 REFERENCES

- A. ASTM International:
1. ASTM A36/A36M - Standard Specification for Carbon Structural Steel.
 2. ASTM A90/A90M - Standard Test Method for Weight Mass of Coating on Iron and Steel Articles with Zinc or Zinc-Alloy Coatings.
 3. ASTM A167 - Standard Specification for Stainless and Heat-Resisting Chromium-Nickel Steel Plate, Sheet, and Strip.
 4. ASTM A568/A568M - Standard Specification for Steel, Sheet, Carbon, and High-Strength, Low-Alloy, Hot-Rolled and Cold-Rolled, General Requirements for.
 5. ASTM A653/A653M - Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process.
 6. ASTM A1008/A1008M - Standard Specification for Steel, Sheet, Cold-Rolled, Carbon, Structural, High-Strength Low-Alloy and High-Strength Low-Alloy with Improved Formability.
 7. ASTM A1011/A1011M - Standard Specification for Steel, Sheet and Strip, Hot-Rolled, Carbon, Structural, High-Strength Low-Alloy and High-Strength Low-Alloy with Improved Formability.
 8. ASTM B209 - Standard Specification for Aluminum and Aluminum-Alloy Sheet and Plate.
 9. ASTM B209M - Standard Specification for Aluminum and Aluminum-Alloy Sheet and Plate (Metric).
 10. ASTM C14 - Standard Specification for Concrete Sewer, Storm Drain, and Culvert Pipe.
 11. ASTM C14M - Standard Specification for Concrete Sewer, Storm Drain, and Culvert Pipe (Metric).
 12. ASTM C443 - Standard Specification for Joints for Circular Concrete Sewer and Culvert Pipe, Using Rubber Gaskets.
 13. ASTM C443M - Standard Specification for Joints for Circular Concrete Sewer and Culvert Pipe, Using Rubber Gaskets (Metric).
 14. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials.

- B. National Fire Protection Association:
 1. NFPA 90A - Standard for the Installation of Air Conditioning and Ventilating Systems.
 2. NFPA 90B - Standard for the Installation of Warm Air Heating and Air Conditioning Systems.
 3. NFPA 96 - Standard for Ventilation Control and Fire Protection of Commercial Cooking Operations.
- C. Sheet Metal and Air Conditioning Contractors:
 1. SMACNA - Fibrous Glass Duct Construction Standards.
 2. SMACNA - HVAC Air Duct Leakage Test Manual.
 3. SMACNA - HVAC Duct Construction Standard - Metal and Flexible.
- D. Underwriters Laboratories Inc.:
 1. UL 181 - Factory-Made Air Ducts and Connectors.

1.03 PERFORMANCE REQUIREMENTS

- A. Variation of duct configuration or sizes other than those of equivalent or lower loss coefficient is not permitted except by written permission. Size round ducts installed in place of rectangular ducts in accordance with ASHRAE table of equivalent rectangular and round ducts.

1.04 SUBMITTALS

- A. Section 01 33 00 - Submittal Procedures: Submittal procedures.
- B. Shop Drawings: Submit duct fabrication drawings, drawn to scale not smaller than 1/8 inch equals 1 foot, on drawing sheets same size as Contract Documents, indicating:
 1. Fabrication, assembly, and installation details, including plans, elevations, sections, details of components, and attachments to other work.
 2. Duct layout, indicating pressure classifications and sizes in plan view. For exhaust duct systems, indicate classification of materials handled as defined in this section.
 3. Fittings.
 4. Reinforcing details and spacing.
 5. Seam and joint construction details.
 6. Penetrations through fire rated and other walls.
 7. Terminal unit, coil, and humidifier installations.
 8. Hangers and supports, including methods for building attachment, vibration isolation, and duct attachment.
- C. Product Data: Submit data for duct materials, duct liner, and duct connectors.
- D. Test Reports: Indicate pressure tests performed. Include date, section tested, test pressure, and leakage rate, following SMACNA HVAC Air Duct Leakage Test Manual.

1.05 CLOSEOUT SUBMITTALS

- A. Section 01 70 00 - Execution and Closeout Requirements: Closeout procedures.
- B. Project Record Documents: Record actual locations of ducts and duct fittings. Record changes in fitting location and type. Show additional fittings used.

1.06 QUALITY ASSURANCE

- A. Perform Work in accordance with SMACNA - HVAC Duct Construction Standards - Metal and flexible.
- B. Construct ductwork to NFPA 90A, NFPA 90B, and NFPA 96 standards.

- C. Maintain one copy of each document on site.

1.07 QUALIFICATIONS

- A. Manufacturer: Company specializing in manufacturing products specified in this section with minimum three years experience.
- B. Installer: Company specializing in performing Work of this section with minimum three years experience.

1.08 ENVIRONMENTAL REQUIREMENTS

- A. Section 01 60 00 - Product Requirements.
- B. Do not install duct sealant when temperatures are less than those recommended by sealant manufacturers.
- C. Maintain temperatures during and after installation of duct sealant.

1.09 FIELD MEASUREMENTS

- A. Verify field measurements prior to fabrication.

PART 2 PRODUCTS

2.01 DUCT MATERIALS

- A. Galvanized Steel Ducts: ASTM A653/A653M galvanized steel sheet, lock-forming quality, having G90 zinc coating of in conformance with ASTM A90/A90M.
- B. Steel Ducts: ASTM A1008/A1008M.
- C. Aluminum Ducts: ASTM B209 (ASTM B209M); aluminum sheet, alloy 3003-H14. Aluminum Connectors and Bar Stock: Alloy 6061-T6 or of equivalent strength.
- D. Hanger Rod: ASTM A36/A36M; steel, galvanized; threaded both ends, threaded one end, or continuously threaded.

2.02 INSULATED FLEXIBLE DUCTS

- A. UL 181, Class 1, constructed with interior liner of round corrugated steel or aluminum duct with exterior fiberglass insulation and vinyl film vapor barrier.
 1. Pressure Rating: 10 inches wg (2.5 kPa) positive or negative.
 2. Maximum Velocity: 4000 fpm (20.3 m/s).
 3. Temperature Range: -20 degrees F to 210 degrees F (-28 degrees C to 99 degrees C).
 4. Thermal Resistance: 4.2 square feet-hour-degree F per BTU.
 5. Furnish each flexible duct section with integral clamping devices for connection to round or oval fittings and screws.
 6. Join each flexible duct section to main trunk duct through sheet metal fittings. Construct fittings of galvanized steel and equip with factory installed volume damper having positive locking regulator. Provide fittings installed in lined ductwork with insulation guard.
 7. Maximum field measured pressure drop shall not exceed 0.1 inches in 5'-0" at design air flow. If it does, increase size until pressure drop is within specification.
 8. Flexible ductwork shall be a minimum of 2 inches larger than equipment inlet or that shown on Contract Documents, whichever is larger. Provide reducers to fit equipment or neck sizes of air flow devices.
 9. Limit length to 5'-0" of flex. Extend hard duct to limit flex to 5'-0".

10. Provide spreader type hanger supports. Do not use flexible ductwork to make 90° elbows. Provide hard duct elbows.

2.03 SINGLE WALL SPIRAL ROUND DUCTS

- A. Product Description: UL 181, Class 1, round spiral lockseam duct constructed of galvanized steel.
- B. Construct duct with the following minimum gages:
- | Diameter | Gauge |
|---------------------------|-------|
| 1. 3 inches to 14 inches | 26 |
| 2. 15 inches to 26 inches | 24 |
| 3. 28 inches to 36 inches | 22 |
| 4. 38 inches to 50 inches | 20 |
| 5. 52 inches to 84 inches | 18 |
- C. Construct fittings with the following minimum gages:
- | Diameter | Gauge |
|---------------------------|-------|
| 1. 3 inches to 14 inches | 24 |
| 2. 15 inches to 26 inches | 22 |
| 3. 28 inches to 36 inches | 20 |
| 4. 38 inches to 50 inches | 20 |
| 5. 52 inches to 60 inches | 18 |
| 6. 62 inches to 84 inches | 16 |

2.04 DUCTWORK FABRICATION

- A. Fabricate and support rectangular ducts in accordance with SMACNA HVAC Duct Construction Standards - Metal and Flexible and as indicated on Drawings. Provide duct material, gages, reinforcing, and sealing for operating pressures indicated.
- B. Fabricate and support round ducts with spiral seams in accordance with SMACNA HVAC Duct Construction Standards - Metal and Flexible (Round Duct Construction Standards). Provide duct material, gages, reinforcing, and sealing for operating pressures indicated.
- C. Construct T's, bends, and elbows with minimum radius 1-1/2 times centerline duct width. Where not possible and where rectangular elbows are used, provide turning vanes. Where acoustical lining is indicated, furnish turning vanes of perforated metal with glass fiber insulation.
- D. Increase duct sizes gradually, not exceeding 15 degrees divergence wherever possible; maximum 30 degrees divergence upstream of equipment and 45 degrees convergence downstream.
- E. Fabricate continuously welded round and oval duct fittings two gages heavier than duct gages indicated in SMACNA Standard. Minimum 4 inch (100 mm) cemented slip joint, brazed or electric welded. Prime coat welded joints.
- F. Provide standard 45-degree lateral wye takeoffs. When space does not allow 45-degree lateral wye takeoff, use 90-degree conical tee connections.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Section 01 30 00 - Administrative Requirements: Coordination and project conditions.
- B. Verify sizes of equipment connections before fabricating transitions.

C. INSTALLATION

- D. Install and seal ducts in accordance with SMACNA HVAC Duct Construction Standards - Metal and Flexible. Use high pressure duct sealant on all joints and seams, inside and outer cover for double wall duct systems.
- E. During construction, install temporary closures of metal or taped polyethylene on open ductwork to prevent construction dust from entering ductwork system.
- F. Use crimp joints with or without bead or beaded sleeve couplings for joining round duct sizes 10 inch and smaller.
- G. Install duct hangers and supports in accordance with SMACNA and such as not to have sags in runs.
- H. Use double nuts and lock washers on threaded rod supports.
- I. Connect flexible ducts to metal ducts with adhesive, draw bands, plus sheet metal screws. Provide a minimum of two screws opposite of each other on round duct extractors. Install extractor spin ins with four screws, one on each corner. Do not make 90 degree turns with flexible ductwork. Provide rigid ductwork for all elbows.
- J. Connect flexible ducts to metal ducts with draw bands and adhesive plus sheet metal screws. Maximum flexible length shall not exceed 5 feet, 0 inches.
- K. Set plenum doors 6 to 12 inches (150 to 300 mm) above floor. Arrange door swing so fan static pressure holds door in closed position.
- L. Install kitchen range hoods in accordance with NFPA 96 with stainless steel type 304 welded for exhaust ducts.
- M. Install residue traps in kitchen hood exhaust ducts at base of vertical risers with provisions for clean out.
- N. Kitchen Hood Exhaust Ducts: Use 316 stainless steel for ductwork exposed to view and 304 stainless steel where ducts are concealed.

3.02 INTERFACE WITH OTHER PRODUCTS

- A. Install openings in ductwork where required to accommodate thermometers and controllers. Install pitot tube openings for testing of systems. Install pitot tube complete with metal can with spring device or screw to prevent air leakage. Where openings are provided in insulated ductwork, install insulation material inside metal ring.
- B. Connect diffusers boots to low pressure ducts directly above hard ceiling with 5 feet (1.5 m) maximum length of flexible duct held in place with strap or clamp above lay-in ceilings.
- C. Connect air terminal units and air outlets and inlets to supply ducts directly or with five foot (1.5 m) maximum length of flexible duct. Do not use flexible duct to change direction above hard ceilings. Direct connections required.

3.03 CLEANING

- A. Section 01 70 00 - Execution and Closeout Requirements: Final cleaning.
- B. Clean duct system and force air at high velocity through duct to remove accumulated dust. To obtain sufficient air flow, clean one half of system completely before proceeding to other half.

Protect equipment with potential to be harmed by excessive dirt with temporary filters, or bypass during cleaning.

- C. Clean duct systems with high power vacuum machines. Protect equipment with potential to be harmed by excessive dirt with filters, or bypass during cleaning. Install access openings into ductwork for cleaning purposes.
- D. Provide caps on open ductwork to keep debris/dirt from entering hung ductwork.

3.04 SCHEDULES

DUCTWORK MATERIAL SCHEDULE

AIR SYSTEM	MATERIAL
Supply (Heating Systems)	Galvanized Steel, Aluminum
Supply (System with Cooling Coils)	Galvanized Steel, Aluminum
Return and Relief	Galvanized Steel, Aluminum
General Exhaust	Galvanized Steel, Aluminum
Outside Air Intake	Galvanized Steel

DUCTWORK PRESSURE CLASS SCHEDULE

AIR SYSTEM	PRESSURE CLASS
Constant Volume Supply	3 inch wg regardless of velocity.
Supply (Heating Systems)	3 inch wg
Supply (System with Cooling Coils)	3 inch wg
Return and Relief	2 inch wg regardless of velocity.
General Exhaust	2 inch wg regardless of velocity.

END OF SECTION

SECTION 23 33 00

DUCTWORK ACCESSORIES

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Air turning devices/extractors.
- B. Backdraft dampers.
- C. Combination fire and smoke dampers.
- D. Duct access doors.
- E. Duct test holes.
- F. Fire dampers.
- G. Flexible duct connections.
- H. Volume control dampers.

1.02 RELATED SECTIONS

- A. Section 23 31 00 - Ducts.
- B. Section 23 36 00 - Air Terminal Units: Pressure regulating damper assemblies.
- C. Division 26 - Equipment Wiring Systems: Electrical characteristics and wiring connections.

1.03 REFERENCES

- A. NFPA 90A - Installation of Air Conditioning and Ventilating Systems.
- B. NFPA 92A - Smoke Control Systems.
- C. NFPA 70 - National Electrical Code.
- D. SMACNA - HVAC Duct Construction Standards - Metal and Flexible.
- E. UL 33 - Heat Responsive Links for Fire-Protection Service.
- F. UL 555 - Fire Dampers and Ceiling Dampers.
- G. UL 555S - Leakage Rated Dampers for Use in Smoke Control Systems.

1.04 SUBMITTALS

- A. Submit Shop Drawings: Indicate for shop fabricated assemblies including volume control dampers, duct access doors and duct test holes.

- B. Product Data: Provide for shop fabricated assemblies including volume control dampers, duct access doors, duct test holes and hardware used. Include electrical characteristics and connection requirements.
- C. Manufacturer's Installation Instructions: Indicate for fire dampers and combination fire and smoke dampers.

1.05 PROJECT RECORD DOCUMENTS

- A. Submit and record actual locations of access doors, test holes and volume dampers.

1.06 QUALIFICATIONS

- A. Manufacturer: Company specializing in manufacturing the Products specified in this section with minimum three years documented experience.

1.07 REGULATORY REQUIREMENTS

- A. Products Requiring Electrical Connection: Listed and classified by Underwriters' Laboratories Inc., as suitable for the purpose specified and indicated.

1.08 DELIVERY, STORAGE, AND HANDLING

- A. Deliver, store, protect and handle products to site.
- B. Protect dampers from damage to operating linkages and blades.

PART 2 PRODUCTS

2.01 AIR TURNING DEVICES/EXTRACTORS

- A. Multi-blade device with radius blades attached to pivoting frame and bracket, steel or aluminum construction, with worm drive mechanism with 18 inch long removable key operator.

2.02 BACKDRAFT DAMPERS

- A. Gravity Backdraft Dampers, Size 24 x 24 inches or Smaller, Furnished with Air Moving Equipment: Air moving equipment manufacturers standard construction.
- B. Multi-Blade, Parallel Action Gravity Balanced Backdraft Dampers: 16 gage thick galvanized steel, or extruded aluminum, with center pivoted blades of maximum 6 inch width, with felt or flexible vinyl sealed edges, linked together in rattle-free manner with 90 degree stop, ball bearings, and plated pivot pin; adjustment device to permit setting for varying differential static pressure.

2.03 COMBINATION FIRE AND SMOKE DAMPERS

- A. Provide where required by Code having jurisdiction.
- B. Fabricate in accordance with NFPA 90A, UL 555, UL 555S, and as indicated.
- C. Provide factory sleeve and collar for each damper.
- D. Multiple Blade Dampers: Fabricate with 16 gage galvanized steel frame and blades, oil-impregnated bronze or stainless steel sleeve bearings and plated steel axles, stainless steel

jamb seals, 1/8 x 1/2 inch plated steel concealed linkage, stainless steel closure spring, blade stops, and lock, and 1/2 inch actuator shaft.

- E. Operators: UL listed and labeled spring return electric type suitable for 120 volts, single phase, 60 Hz. Locate damper operator on exterior of duct and link to damper operating shaft.
- F. Normally Closed Smoke Responsive Fire Dampers: Curtain type, opening by gravity upon actuation of electro thermal link, flexible stainless steel blade edge seals to provide constant sealing pressure.
- G. Normally Open Smoke Responsive Fire Dampers: Curtain type, closing upon actuation of electro thermal link, flexible stainless steel blade edge seals to provide constant sealing pressure, stainless steel springs with locking devices to ensure positive closure for units mounted horizontally.
- H. Electro Thermal Link: Fusible link melting at 165 degrees F; 120 volts, single phase, 60 Hz; UL listed and labeled.

2.04 DUCT ACCESS DOORS

- A. Fabricate in accordance with SMACNA HVAC Duct Construction Standards - Metal and Flexible, and as indicated.
- B. Fabrication: Rigid and close-fitting of galvanized steel with sealing gaskets and quick fastening locking devices. For insulated ductwork, install minimum one inch thick insulation with sheet metal cover.
 1. Less Than 12 Inches Square: Secure with sash locks.
 2. Up to 18 Inches Square: Provide two hinges and two sash locks.
- C. Access doors with sheet metal screw fasteners are not acceptable.

2.05 DUCT TEST HOLES

- A. Temporary Test Holes: Cut or drill in ducts as required. Cap with neat patches, threaded plugs, or threaded or twist-on metal caps.
- B. Permanent Test Holes: Factory fabricated, air tight flanged fittings with screw cap. Provide extended neck fittings to clear insulation.

2.06 FIRE DAMPERS

- A. Provide where required by Codes having jurisdiction and in all rated walls whether indicated on plans or not.
- B. Fabricate in accordance with NFPA 90A and UL 555, and as indicated.
- C. Horizontal Dampers: Code approved, Galvanized steel, 22 gage frame, stainless steel closure spring, and lightweight, heat retardant non-asbestos fabric blanket.
- D. Curtain Type Dampers: Code approved, Galvanized steel with interlocking blades. Provide stainless steel closure springs and latches for horizontal installations closure under air flow conditions. Configure with blades out of air stream.
- E. Code approved Multiple Blade Dampers: 16 gage galvanized steel frame and blades, oil-impregnated bronze or stainless steel sleeve bearings and plated steel axles, 1/8 x 1/2 inch plated steel concealed linkage, stainless steel closure spring, blade stops, and lock.

- F. Fusible Links: UL 33, separate at 160 degrees F with adjustable link straps for combination fire/balancing dampers.

2.07 FLEXIBLE DUCT CONNECTIONS

- A. Fabricate in accordance with SMACNA HVAC Duct Construction Standards - Metal and Flexible, and as indicated.
- B. Connector: Fabric crimped into metal edging strip.
 1. Fabric: UL listed fire-retardant neoprene coated woven glass fiber fabric to NFPA 90A, minimum density 30 oz per sq yd.
 2. Net Fabric Width: Approximately 3 inches wide.

2.08 SMOKE DAMPERS

- A. Provide where required by Code having jurisdiction.
- B. Fabricate in accordance with NFPA 90A and UL 5555, and as indicated.
- C. Dampers: UL Class 1 multiple blade type fire damper, normally open automatically operated by electric actuator.
- D. Electro Thermal Link: Fusible link melting at 165 degrees F; 120 volts, single phase, 60 Hz; UL listed and labeled.

2.09 VOLUME CONTROL DAMPERS

- A. Fabricate in accordance with SMACNA HVAC Duct Construction Standards - Metal and Flexible, and as indicated.
- B. Splitter Dampers:
 1. Material: Same gage as duct to 24 inches size in either direction, and two gages heavier for sizes over 24 inches.
 2. Blade: Fabricate of double thickness sheet metal to streamline shape, secured with continuous hinge or rod.
 3. Operator: Minimum 1/4 inch diameter rod in self aligning, universal joint action, flanged bushing with set screw.
- C. Multi-Blade Damper: Fabricate of opposed blade pattern with maximum blade sizes 8 x 72 inch. Assemble center and edge crimped blades in prime coated or galvanized channel frame with suitable hardware.
- D. End Bearings: Except in round ductwork 12 inches and smaller, provide end bearings. On multiple blade dampers, provide oil-impregnated nylon or sintered bronze bearings.
- E. Quadrants:
 1. Provide locking, indicating quadrant regulators on single and multi-blade dampers.
 2. On insulated ducts mount quadrant regulators on stand-off mounting brackets, bases, or adapters.
 3. Where rod lengths exceed 30 inches provide regulator at both ends.

PART 3 EXECUTION

3.01 PREPARATION

- A. Verify that electric power is available and of the correct characteristics for all devices requiring electrical power.

3.02 INSTALLATION

- A. Install accessories in accordance with manufacturer's instructions, NFPA 90A, and follow SMACNA HVAC Duct Construction Standards - Metal and Flexible. Refer to Section 23 31 00 for duct construction and pressure class.
- B. Provide backdraft dampers on exhaust fans or exhaust ducts nearest to outside and where indicated.
- C. Provide duct access doors for inspection and cleaning before and after filters, coils, fans, automatic dampers, at fire dampers, combination fire and smoke dampers, and elsewhere as indicated.
- D. Provide duct test holes where indicated and required for testing and balancing purposes.
- E. Provide fire dampers, combination fire and smoke dampers and smoke dampers at locations indicated, where ducts and outlets pass through fire rated components, and where required by authorities having jurisdiction. Install with required perimeter mounting angles, sleeves, breakaway duct connections, corrosion resistant springs, bearings, bushings and hinges.
- F. Install smoke dampers and combination smoke and fire dampers in accordance with NFPA 92A.
- G. Demonstrate re-setting of fire dampers to Owner's representative.
- H. Provide flexible connections immediately adjacent to equipment in ducts associated with fans and motorized equipment, and supported by vibration isolators.
- I. Provide balancing dampers at points on supply, return, and exhaust systems where branches are taken from larger ducts as required for air balancing. Install minimum 2 duct widths from duct take-off.
- J. Use splitter dampers only where indicated.
- K. Provide balancing dampers on duct take-off to diffusers, grilles, and registers, regardless of whether dampers are specified as part of the diffuser, grille, or register assembly.

END OF SECTION

SECTION 23 34 00

POWER VENTILATORS

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Cabinet and ceiling exhaust fans.

1.02 RELATED SECTIONS

- A. Section 23 05 13 - Motors.
- B. Section 23 31 00 - Ducts.
- C. Section 23 33 00 - Duct Accessories: Backdraft dampers.
- D. Division 26 - Equipment Wiring Systems: Electrical characteristics and wiring connections.

1.03 REFERENCES

- A. AMCA 99 - Standards Handbook.
- B. AMCA 210 - Laboratory Methods of Testing Fans for Rating Purposes.
- C. AMCA 261 - Directory of Products Licensed to Bear the AMCA Certified Ratings Seal.
- D. AMCA 300 - Test Code for Sound Rating Air Moving Devices.
- E. AMCA 301 - Method of Publishing Sound Ratings for Air Moving Devices.
- F. NEMA MG1 - Motors and Generators.
- G. NFPA 96 - Installation of Equipment for the Removal of Smoke and Grease Vapors from Commercial cooking Equipment.
- H. UL 705 - Power Ventilators.

1.04 SUBMITTALS FOR REVIEW

- A. Product Data: Provide data on fans and accessories including fan curves with specified operating point clearly plotted, power, RPM, sound power levels at rated capacity, and electrical characteristics and connection requirements.

1.05 SUBMITTALS FOR INFORMATION

- A. Manufacturer's Instructions: Indicate installation instructions.

1.06 SUBMITTALS AT PROJECT CLOSEOUT

- A. Maintenance Data: Include instructions for lubrication, motor and drive replacement, spare parts list, and wiring diagrams.
- B. Warranty: Submit manufacturer warranty and ensure forms have been completed in Owner's

name and registered with manufacturer. All fans shall require 5 year warranty.

1.07 QUALITY ASSURANCE

- A. Manufacturer Qualifications: Company specializing in manufacturing the Products specified in this section with minimum three years experience.

1.08 REGULATORY REQUIREMENTS

- A. Kitchen Range Hood Exhaust Fans: Comply with requirements of NFPA 96.
- B. Products Requiring Electrical Connection: Listed and classified by Underwriters Laboratories Inc., as suitable for the purpose specified and indicated.

1.09 EXTRA MATERIALS

- A. Supply two sets of belts for each fan.

1.10 PRE-INSTALLATION MEETINGS

- A. Convene minimum one week prior to commencing work of this section.

1.11 DELIVERY, STORAGE AND HANDLING

- A. Protect motors, shafts, and bearings from weather and construction dust.

1.12 FIELD MEASUREMENTS

- A. Verify field measurements prior to fabrication.

1.13 MAINTENANCE SERVICE

- A. Furnish service and maintenance of fans for one years from Date of Substantial Completion.
- B. Examine each fans' components monthly. Clean, adjust, and lubricate equipment.
- C. Include systematic examination, adjustment, and lubrication of fans, and controls checkout and adjustments. Repair or replace parts in accordance with manufacturer's operating and maintenance data. Use parts produced by manufacturer of original equipment.
- D. Perform work without removing fans from service during building normal occupied hours.
- E. Provide emergency call back service during working hours for this maintenance period.
- F. Maintain locally, near Place of the Work, adequate stock of parts for replacement or emergency purposes. Have personnel available to ensure fulfillment of this maintenance service, without unreasonable loss of time.
- G. Perform maintenance work using competent and qualified personnel under supervision of manufacturer or original installer.
- H. Do not assign or transfer maintenance service to agent or subcontractor without prior written consent of Owner.

PART 2 PRODUCTS**2.01 CABINET AND CEILING EXHAUST FANS**

- A. Centrifugal Fan Unit: V-belt or direct driven with galvanized steel housing lined with ½ inch (13 mm) acoustic insulation, resilient mounted motor, gravity backdraft damper in discharge.
- B. Disconnect Switch: Cord and plug in housing for thermal overload protected motor solid state speed controller.
- C. Grille: Molded white plastic.
- D. Sheaves: Cast iron or steel, dynamically balanced, bored to fit shafts and keyed; variable and adjustable pitch motor sheaves selected so required rpm is obtained with sheaves set at mid-position; fan shaft with self-aligning pre-lubricated ball bearings.

PART 3 EXECUTION**3.01 EXAMINATION**

- A. Verify roof curbs are installed and dimensions are as instructed by manufacturer.

3.02 INSTALLATION

- A. Secure roof and wall fans with stainless steel lag screws to roof curb or wall structure.
- B. Install backdraft dampers and gravity shutters on roof and wall exhaust fans and gravity ventilators used in relief air applications, as shown on Drawings.
- C. Provide backdraft dampers on outlet from square in-line fans and ceiling fans and as indicated on Drawings.
- D. Install safety screen where inlet or outlet is exposed.
- E. Pipe scroll drains to nearest gutter drain.
- F. Support ceiling and square in-line exhaust fans separate from ductwork.
- G. Install flex connections on inlet and outlet of all square in-line and ceiling exhaust fans, and where indicated on Drawings.
- H. Provide adjustable pitch sheaves required for final air balance.

3.03 MANUFACTURER'S FIELD SERVICES

- A. Furnish services of factory trained representative for minimum of 4 hours to start-up, calibrate controls, and instruct Owner on operation and maintenance.

3.04 CLEANING

- A. Vacuum clean coils and inside of fan cabinet.

3.05 DEMONSTRATION

- A. Demonstrate fan operation and maintenance procedures.

3.06 PROTECTION OF FINISHED WORK

- A. Do not operate fans for until ductwork is clean, filters in place, bearings lubricated, and fan has been test run under observation.
- B. Provide sheaves required for final air balance.
- C. Install backdraft dampers on inlet to roof and wall exhausters.
- D. Provide backdraft dampers on outlet from cabinet and ceiling exhauster fans and as indicated.
- E. Do not operate fans until ductwork is clean, filters are in place, and bearings are lubricated.

END OF SECTION

SECTION 23 37 00

AIR OUTLETS AND INLETS

PART 1 GENERAL

1.01 SUMMARY

- A. Section Includes:
 - 1. Diffusers.
 - 2. Registers
 - 3. Grilles.
 - 4. Door grilles.
 - 5. Louvers.
 - 6. Roof hoods.

- B. Related Sections:
 - 1. Section 09 90 00 - Paint and Coating: Execution and product requirements for Painting of ductwork visible behind outlets and inlets specified by this section.
 - 2. Section 08 91 00 - Louvers: Wall Louvers.
 - 3. Section 23 33 00 - Ductwork Accessories: Volume dampers for inlets and outlets.
 - 4. Section 23 09 23 - Energy Management Control Systems (EMCS).

1.02 REFERENCES

- A. Air Movement and Control Association International, Inc.:
 - 1. AMCA 500 - Test Methods for Louvers, Dampers, and Shutters.

- B. American Society of Heating, Refrigerating and Air-Conditioning Engineers:
 - 1. ASHRAE 70 - Method of Testing for Rating the Performance of Air Outlets and Inlets.

- C. Sheet Metal and Air Conditioning Contractors:
 - 1. SMACNA - HVAC Duct Construction Standard - Metal and Flexible.

1.03 SUBMITTALS

- A. Section 01 33 00 - Submittal Procedures: Submittal procedures.

- B. Product Data: Submit sizes, finish, and type of mounting. Submit schedule of outlets and inlets showing type, size, location, application, and noise level.

- C. Samples: Submit two of each required air outlet and inlet type.

- D. Test Reports: Rating of air outlet and inlet performance.

- E. Manufacturer's Certificate: Certify products meet or exceed specified requirements.

1.04 CLOSEOUT SUBMITTALS

- A. Section 01 70 00 - Execution and Closeout Requirements: Closeout procedures.

- B. Project Record Documents: Record actual locations of air outlets and inlets.

1.05 QUALITY ASSURANCE

- A. Test and rate diffuser, register, and grille performance in accordance with ASHRAE 70.
- B. Test and rate louver performance in accordance with AMCA 500.

1.06 QUALIFICATIONS

- A. Manufacturer: Company specializing in manufacturing products specified in this section with minimum three years experience.

1.07 PRE-INSTALLATION MEETINGS

- A. Section 01 30 00 - Administrative Requirements: Pre-installation meeting.
- B. Convene minimum one week prior to commencing work of this section.

1.08 WARRANTY

- A. Section 01 70 00 - Execution and Closeout Requirements: Product warranties and product bonds.
- B. Furnish one year manufacturer warranty for air outlets and inlets.

1.09 EXTRA MATERIALS

- A. Furnish 24" x 24" lay in air outlets and inlets; a minimum of one of each type with a ten inch round neck for review with submittal.

PART 2 PRODUCTS

2.01 GENERAL

- A. All products and accessories to be aluminum when available as standard or as an option.

2.02 RECTANGULAR CEILING DIFFUSERS

- A. Manufacturers:
 - 1. Price Air Products.
 - 2. Krueger.
 - 3. Titus.
 - 4. Tuttle and Bailey.
 - 5. Substitutions: Permitted.
- B. Type: Square and rectangular, adjustable pattern, multi-louvered] diffuser to discharge air in one way or four-way pattern with sector baffles as indicated on Drawings.
- C. Frame: Surface mount type. In plaster ceilings, furnish plaster frame and ceiling frame.
- D. Fabrication: Aluminum with baked enamel off-white finish.
- E. Accessories: Radial opposed-blade damper and multi-louvered equalizing grid with damper adjustable from diffuser face. Provide aluminum construction if option is available.

2.03 CEILING SUPPLY REGISTERS/GRILLES

- A. Manufacturers:
 - 1. Price Air Products.
 - 2. Krueger.
 - 3. Titus.
 - 4. Tuttle and Bailey.
 - 5. Substitutions: Permitted.
- B. Type: Streamlined and individually adjustable curved blades to discharge air along face of grille, one-way or two-way deflection.
- C. Frame: 1-1/4 inch margin with concealed mounting and gasket.
- D. Fabrication: Aluminum extrusions with factory off-white enamel finish to match ceilings.
- E. Damper: Integral, gang-operated, opposed-blade type with removable key operator, operable from face. Provide aluminum if available as option.

2.04 CEILING EXHAUST AND RETURN REGISTERS/GRILLES

- A. Manufacturers:
 - 1. Price Air Products.
 - 2. Krueger.
 - 3. Titus.
 - 4. Tuttle and Bailey.
 - 5. Substitutions: Permitted.
- B. Type: Streamlined blades, 3/4 inch minimum depth, 3/4 maximum spacing, with blades set at 45 degrees, vertical face.
- C. Frame: 1-1/4 inch margin with concealed mounting.
- D. Fabrication: Aluminum extrusions with 20 gage (0.90 mm) minimum frames and 22 gage (0.80 mm) minimum blades, aluminum with 20 gage (0.90 mm) minimum frame, or aluminum extrusions, with factory off-white baked enamel.
- E. Damper: Integral, gang-operated, opposed blade type with removable key operator, operable from face where not individually connected to exhaust fans. Provide aluminum if available as option.

2.05 CEILING GRID CORE EXHAUST AND RETURN REGISTERS/GRILLES

- A. Manufacturers:
 - 1. Price Air Products.
 - 2. Krueger
 - 3. Titus.
 - 4. Tuttle and Bailey.
 - 5. Substitutions: Permitted.
- B. Type: Fixed grilles of 1/2 x 1/2 x 1 inch grilles.
- C. Fabrication: Aluminum with factory off-white baked enamel.
- D. Frame: 1 inch margin with concealed mounting. Channel lay-in frame for suspended grid ceilings.

- E. Damper: Integral, gang-operated, opposed-blade type with removable key operator, operable from face. Provide aluminum if available as option.

2.06 WALL SUPPLY REGISTERS/GRILLES

- A. Manufacturers:
 - 1. Price Air Products.
 - 2. Krueger.
 - 3. Titus.
 - 4. Tuttle and Bailey.
 - 5. Substitutions: Permitted.
- B. Type: Streamlined and individually adjustable blades, 3/4 inch (19 mm) minimum depth, maximum spacing with spring or other device to set blades, vertical face, double deflection.
- C. Frame: 1-1/4 inch margin with concealed mounting and gasket.
- D. Fabrication: Aluminum extrusions, with factory off-white baked enamel finish.
- E. Damper: Integral, gang-operated opposed blade type with removable key operator, operable from face. Provide aluminum if available as option.

2.07 WALL EXHAUST AND RETURN REGISTERS/GRILLES

- A. Manufacturers:
 - 1. Price Air Products.
 - 2. Krueger.
 - 3. Titus.
 - 4. Tuttle and Bailey.
 - 5. Substitutions: Permitted.
- B. Type: Streamlined blades, 3/4 inch (19 mm) minimum depth, 3/4 inch (19 mm) maximum spacing, with spring or other device to set blades, vertical face.
- C. Frame: 1-1/4 inch margin with concealed mounting.
- D. Fabrication: Aluminum extrusions, with factory baked enamel finish, color to be selected.
- E. Damper: Integral, gang-operated, opposed-blade type with removable key operator, operable from face.

2.08 WALL GRID CORE EXHAUST AND RETURN REGISTERS/GRILLES

- A. Manufacturers:
 - 1. Price Air Products.
 - 2. Krueger.
 - 3. Titus.
 - 4. Tuttle and Bailey.
 - 5. Substitutions: Permitted.
- B. Type: Fixed grilles of 1/2 x 1/2 x 1 inch louvers.
- C. Frame: 1- inch margin with concealed mounting. Lay-in frame for suspended grid ceilings.
- D. Fabrication: Aluminum with factory off-white baked enamel finish.

- E. Damper: Integral, gang-operated, opposed-blade type with removable key operator, operable from face. Provide aluminum if available as option.

2.09 DOOR GRILLES

- A. Manufacturers:
 1. Anemostat Air Products.
 2. Krueger.
 3. Titus.
 4. Tuttle and Bailey.
 5. Substitutions: Permitted.
- B. Type: V-shaped louvers of 20 gage (0.90 mm) thick steel, 1 inch (25 mm) deep on 1/2 inch (13 mm) centers.
- C. Frame: 20 gage (0.90 mm) steel with auxiliary frame to give finished appearance on both sides of door, with factory bronze anodized dark finish.

2.10 LOUVERS

- A. See Architectural for type and operational type. (Exterior wall type)
- B. Louvers: As specified in Section 08 91 00. See Architectural.
- C. Fixed Miami Dade Hurricane Rated for Coastal Applications and impact.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Section 01 30 00 - Administrative Requirements: Coordination and project conditions.
- B. Verify inlet and outlet locations.
- C. Verify ceiling and wall systems are ready for installation.

3.02 INSTALLATION

- A. Install diffusers to ductwork with airtight connection using screws, strapping, and mastic to give airtight assembly.
- B. Install balancing dampers on duct take-off to diffusers, grilles, and registers, whether or not dampers are furnished as part of diffuser, grille, and register assembly.
- C. Paint visible portion of ductwork behind all air outlets and inlets matte black. Refer to Section 09 90 00.

3.03 INTERFACE WITH OTHER PRODUCTS

- A. Check location of outlets and inlets and make necessary adjustments in position to conform to architectural features, symmetry, and lighting arrangement. Refer to Architect's reflected ceiling plan for exact placement. Separate all supply and return on maximum spacing when possible. Supply air to remain as close to Mechanical Plan placement as possible.

END OF SECTION

SECTION 23 81 06

PACKAGED ROOFTOP AIR CONDITIONING UNITS - MEDIUM CAPACITY

PART 1 GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Packaged rooftop air conditioning unit.
 - 2. Roof curb:
 - a. Vibration isolation type.
 - b. Roof Slope Compensation built into curb.
- B. Related Sections:
 - 1. Section 23 05 48 - Vibration Isolation
 - 2. Section 23 22 13 - Condensate Drain Piping
 - 3. Section 23 33 00 - Ductwork Accessories.

1.2 REFERENCES

- A. Air-Conditioning and Refrigeration Institute:
 - 1. ARI 270 - Sound Rating of Outdoor Unitary Equipment.
 - 2. ARI 340/360 - Commercial and Industrial Unitary Air-Conditioning and Heat Pump Equipment.
- B. Air Movement and Control Association International, Inc.:
 - 1. AMCA 500 - Test Methods for Louvers, Dampers, and Shutters.
- C. American Society of Heating, Refrigerating and Air-Conditioning Engineers:
 - 1. ASHRAE 52.1 - Gravimetric and Dust-Spot Procedures for Testing Air-Cleaning Devices Used in General Ventilation for Removing Particulate Matter.
 - 2. ASHRAE 90.1 - Energy Standard for Buildings Except Low-Rise Residential Buildings.
- D. ASTM International:
 - 1. ASTM B117 - Standard Practice for Operating Salt Spray (Fog) Apparatus.
- E. National Electrical Manufacturers Association:
 - 1. NEMA 250 - Enclosures for Electrical Equipment (1000 Volts Maximum).
 - 2. NEMA MG 1 - Motors and Generators.
- F. National Fire Protection Association:
 - 1. NFPA 54 - National Fuel Gas Code.
 - 2. NFPA 58 - Liquefied Petroleum Gas Code.
 - 3. NFPA 90A - Standard for the Installation of Air Conditioning and Ventilating Systems.

1.3 DEFINITIONS

- A. Energy Efficiency Ratio (EER) - Ratio of net cooling capacity in Btuh to total rate of electric input in watts under designated operating conditions.
- B. Integrated Part-Load Value (IPLV): Single-number figure of merit based on part-load EER, COP, or kW/ton expressing part-load efficiency for air-conditioning and heat pump equipment on basis of weighted operation at various load capacities for the equipment.

1.4 SUBMITTALS

- A. Section 01 33 00 - Submittal Procedures: Submittal procedures.
- B. Product Data: Submit data indicating:
 - 1. Cooling and heating capacities.
 - 2. Dimensions.
 - 3. Weights.
 - 4. Rough-in connections and connection requirements.
 - 5. Duct connections.
 - 6. Electrical requirements with electrical characteristics and connection requirements.
 - 7. Controls.
 - 8. Accessories.
- C. Test Reports: Submit results of factory test at time of unit shipment.
- D. Manufacturer's Installation Instructions: Submit assembly, support details, connection requirements, and include start-up instructions.
- E. Manufacturer's Certificate: Certify products meet or exceed specified requirements.
- F. Manufacturer's Field Reports: Submit start-up report for each unit.

1.5 CLOSEOUT SUBMITTALS

- A. Section 01 70 00 - Execution and Closeout Requirements: Closeout procedures.
- B. Project Record Documents: Record actual locations of controls installed remotely from units.
- C. Operation and Maintenance Data: Submit manufacturer's descriptive literature, operating instructions, installation instructions, and maintenance and repair data.

1.6 QUALITY ASSURANCE

- A. Cooling Capacity: Rate in accordance with ARI 340.
- B. Sound Rating: Measure in accordance with ARI 270.
- C. Insulation and adhesives: Meet requirements of NFPA 90A.
- D. Minimum heating efficiency: 80 percent.
- E. Performance Requirements: Conform to minimum [EER] [IPLV] prescribed by ASHRAE 90.1 when tested in accordance with ARI 340/360.
- F. Outside Air Damper Leakage: Test in accordance with AMCA 500.
- G. Perform Work in accordance with State Municipality of Highways Public Work's standard.
- H. Maintain one copy of each document on site.

1.7 QUALIFICATIONS

- A. Manufacturer: Company specializing in manufacturing products specified in this section with minimum three years documented experience.

- B. Installer: Company specializing in performing Work of this section with minimum three years documented experience approved by manufacturer.

1.8 DELIVERY, STORAGE, AND HANDLING

- A. Section 01 60 00 - Product Requirements: Product storage and handling requirements.
- B. Accept units on site. Inspect for damage.
- C. Protect units from damage by storing off roof until roof mounting curbs are in place.

1.9 COORDINATION

- A. Section 01 30 00 - Administrative Requirements: Requirements for coordination.
- B. Coordinate installation of roof curbs with roof structure, roof deck and roof membrane installation.

1.10 WARRANTY

- A. Section 01 70 00 - Execution and Closeout Requirements: Product warranties and product bonds.
- B. Furnish five years manufacturer's and contractor's warranty for compressors – Parts and labor to change out.
- C. Furnish five years manufacturer's and contractor's warranty for heat exchangers – Parts and labor to change out.
- D. Furnish five years manufacturer's and contractor's warranty for fan motors – Parts and labor to change out.

1.11 MAINTENANCE SERVICE

- A. Section 01 70 00 - Execution and Closeout Requirements: Maintenance service.
- B. Furnish full service and maintenance (parts and labor) of entire unit equipment for one year from Date of Substantial Completion. Five years parts, labor and refrigerant on compressor and its repair or replacement and condenser fan motors. Include maintenance items as shown in manufacturer's operating and maintenance data, including filter replacements, fan belt replacement, and controls checkout and adjustments on a quarterly basis.
- C. Furnish 24-hour emergency service on breakdowns and malfunctions for maintenance period of one year for entire unit and five years for compressor and condenser fan motors.

1.12 EXTRA MATERIALS

- A. Section 01 70 00 - Execution and Closeout Requirements: Spare parts and maintenance products.
- B. Furnish one set of fan belts for each unit.
- C. Furnish twelve sets of disposable pleated filters for each rooftop unit.

PART 2 PRODUCTS

2.1 ROOFTOP AIR CONDITIONING UNITS

- A. Manufacturers:
1. Aeon Incorporated
 2. Carrier Corp.
 3. The Trane Company
 4. McQuay
 5. Substitutions: Section 01 60 00 - Product Requirements Not Permitted.
- B. Product Description: Self-contained, packaged, factory assembled and wired, consisting of vibration isolation type roof curb, cabinet, supply fan, variable frequency drive, evaporator coil, compressor, refrigeration circuit, condenser, electric heating coil, air filters, outdoor air section and controls. Factory sea coast coating on entire unit and coil meeting 3,000 hour salt spray testing. Roof top unit to be heat pumps.
- C. Configuration: Downflow air delivery.
- D. Roof Mounting Curb: 14 inch high, above roof deck surface, aluminum, channel frame with gaskets, nailer strips. Full perimeter curb under entire unit. Curb to be vibration isolation type. Bolt curb to roof structure. Provide certification for seacoast/hurricane 140 plus MPH wind. Provide roof slope compensating roof curb to allow level installation of RTU's.
- E. Cabinet:
1. Designed for outdoor installation with weatherproof construction.
 2. Panels: Steel Galvanized steel with baked enamel finish meeting 500 hour salt spray test in accordance with ASTM B117. Furnish removable access panels with hinged access doors with handles and rubber gaskets at edges.
 3. Insulation: Factory applied to exposed vertical panels, horizontal panels, and access panels/doors. 2 inch thick, 1.5 pound per cubic foot density, neoprene coated or aluminum foil faced glass fiber with edges protected from erosion.
 4. Interior Surfaces: Sheet metal lined creating double wall construction.
- F. Supply Fan:
1. Fan: Forward curved, statically and dynamically balanced, resiliently mounted, VFD rated.
 2. Fan Drive: V-Belt type, Cast iron or steel sheaves, dynamically balanced, bored to fit shafts and keyed. Furnish solid shaft construction. Select Variable and adjustable pitch motor sheave to obtain required rpm with sheaves set at mid-position as recommended by manufacturer.
 - a. Drive Rating: Minimum 1.5 times nameplate rating of motor.
 - b. Fan Sheave: Fixed.
 - c. Motor Sheave: Fixed. VFD rated motor.
 3. Fan motor: Three phase, NEMA MG1, Design B, continuously rated at 40 degrees C, open drip-proof premium with permanently lubricated bearings and integral overload protection.
 4. Fan Assembly Mounting: Furnish spring-type vibration isolators.
- G. Supply Fan Constant Volume
- H. Evaporator Coil:
1. Constructed of seamless copper tubes mechanically expanded into aluminum fins. Factory leak tested under water.
 2. Galvanized drain pan and piping connection.

3. Furnish for multiple circuited units intertwined alternate row circuiting.
 4. Furnish coil with corrosion resistant coating capable of withstanding salt spray test of 3000 hours in accordance with ASTM B117.
- I. Compressors:
1. Hermetically sealed, resiliently mounted with positive lubrication, and internal motor overload protection.
 2. Furnish each compressor with independent refrigeration circuit.
 3. Furnish external vibration isolators.
 4. Furnish short cycle protection.
- J. Refrigeration circuit:
1. Dehydrate and factory charge each circuit with oil and refrigerant.
 2. Furnish the following for each circuit:
 - a. Thermostatic expansion device.
 - b. Filter-drier.
 - c. Suction, discharge, and liquid line service valves with gauge ports.
 - d. Sight glass.
 - e. High and low pressure safety controls.
 3. Furnish capacity control by cycling compressors.
 4. Furnish control to provide low ambient cooling to 0 degrees F.
- K. Condenser:
1. Constructed of copper tubing mechanically bonded to aluminium copper fins with sub-cooling rows. Factory leak tested under water.
 2. Direct drive propeller fans statically and dynamically balanced. Wired to operate with compressor. Motor permanently lubricated with built-in thermal overload protection. Furnish high efficiency fan motors.
 3. Furnish factory installed coil guard.
 4. Furnish coil with corrosion resistant coating capable of withstanding salt spray test of 3000 hours in accordance with ASTM B117.]
- L. Electric Heating Coil:
1. Finned tube heating elements or Helical nickel-chrome resistance wire coil heating elements with refractory ceramic support bushings easily accessible with automatic reset thermal cut-out, built-in magnetic mercury contactors, galvanized steel frame, control circuit transformer and fuse, manual reset thermal cut-out, airflow proving device, toggle switch (pilot duty), load fuses. Single source power connection. Number of stages as indicated on Drawings.
 2. Controls: Start supply fan before electric elements are energized and continue operating until air temperature reaches minimum setting, with switch for continuous fan operation.
- M. Air Filters: 2 inch thick glass fiber disposable media in metal frames. MERC 13 rated based on ASHRAE.
- N. Outdoor Air Section:
1. Outside Air Damper: Automatic with 0 to 25 percent operating range. Outside air damper normally closed and return air damper normally open. Provide interlock with compressor to open when compressor functioning.
- O. Outside Air Section
1. Furnish rain hood with bird screen.

- P. Controls: Microprocessor based controls, factory mounted with the following features:
1. Constant Volume Controls: To operate rooftop from space temperature sensor.
 - a. Furnish space temperature control with setpoint adjustment for control of unit and equipped with override button for programmed timed override of 2 hours.
 2. Control Functions: Furnish the following:
 - a. Unit scheduling.
 - b. Occupied-unoccupied mode.
 - c. Start-up and coast-down modes.
 - d. Nighttime free-cool purge mode.
 - e. Night setback.
 - f. Timed override.
 - g. Alarm shutdown.
 - h. Smoke control. Shut down when smoke detector is activated.
 3. Furnish the following setpoints and diagnostic functions accessible in unit control panel:
 - a. Unit operating mode.
 - b. Unit failure status.
 - c. Supply fan start-stop.
 - d. Return air temperature.
 - e. Cooling control.
 - f. Cooling status - all stages.
 - g. Heating control.
 - h. Heating status.
 - i. Number of stages activated.
 - j. Damper control.
 - k. Space temperature.
 - l. Filter status.
 - m. Smoke detector status.

Q. Accessories:

1. Convenience Outlet: Factory installed, 115 volt, 15 amp, GFI type, internally mounted. Factory wired from transformer internal to unit.
2. Disconnect Switch: Factory mounted, non-fused type, interlocked with access door, accessible from outside unit, with power lockout capability.

2.2 SOURCE QUALITY CONTROL

- A. Section 01 40 00 - Quality Requirements: Testing, inspection and analysis requirements.
- B. Perform factory test of each unit. Test includes:
1. Dynamic trim balance of completed fan assembly.
 2. Complete run check of electrical components and safety controls, including proper control sequencing.
 3. Pressure test, at manufacturer's rated pressure, of refrigerant coils and condenser coils prior to unit assembly.
 4. Leak check of completed refrigerant circuits.
 5. Compressor run check.

PART 3 EXECUTION

3.1 EXAMINATION

- A. Section 01 30 00 - Administrative Requirements: Coordination and project conditions.
- B. Verify roof curbs are installed and dimensions are as shown on shop drawings.

3.2 PREPARATION

- A. Furnish roof curbs to roofing subcontractor for installation.

3.3 INSTALLATION

- A. Roof Curb: Mechanical subcontractor to ensure that:
 - 1. Assemble roof curb. Curb to compensate for roof slope.
 - 2. Install roof curb level.
 - 3. Coordinate curb installation and flashing with Section.
 - 4. Install units on roof curb providing watertight enclosure to protect ductwork and utility services.
 - 5. Install gasket material between unit base and roof curb.
- B. Install RTU's on vibration isolator roof curb.
- C. Connect units to supply and return ductwork with 6" flexible connections on land on fixed base of curb.
- D. Install condensate piping with trap and route from drain pan to nearest roof drain gutter system.
- E. Install components furnished loose for field mounting.
- F. Install electrical devices furnished loose for field mounting.
- G. Install control wiring between unit and field installed accessories.

3.4 MANUFACTURER'S FIELD SERVICES

- A. Section 01 40 00 - Quality Requirements: Requirements for manufacturer's field services.
- B. Furnish services of factory trained representative for minimum of one day to leak test, refrigerant pressure test, evacuate, dehydrate, charge, start-up, calibrate controls, and instruct Owner on operation and maintenance.

3.5 CLEANING

- A. Section 01 70 00 - Execution and Closeout Requirements: Requirements for cleaning.
- B. Vacuum clean coils and inside of cabinets.
- C. Install new throwaway filters in units at Substantial Completion.
- D. Turn over one complete set of filters to Owner upon final inspection and approval.

3.6 DEMONSTRATION

- A. Section 01 70 00 - Execution and Closeout Requirements: Requirements for demonstration and training.

3.2 PREPARATION

- A. Furnish roof curbs to roofing subcontractor for installation.

3.3 INSTALLATION

- A. Roof Curb: Mechanical subcontractor to ensure that:
 - 1. Assemble roof curb. Curb to compensate for roof slope.
 - 2. Install roof curb level.
 - 3. Coordinate curb installation and flashing with Section.
 - 4. Install units on roof curb providing watertight enclosure to protect ductwork and utility services.
 - 5. Install gasket material between unit base and roof curb.
- B. Install RTU's on vibration isolator roof curb.
- C. Connect units to supply and return ductwork with 6" flexible connections on land on fixed base of curb.
- D. Install condensate piping with trap and route from drain pan to nearest roof drain gutter system.
- E. Install components furnished loose for field mounting.
- F. Install electrical devices furnished loose for field mounting.
- G. Install control wiring between unit and field installed accessories.

3.4 MANUFACTURER'S FIELD SERVICES

- A. Section 01 40 00 - Quality Requirements: Requirements for manufacturer's field services.
- B. Furnish services of factory trained representative for minimum of one day to leak test, refrigerant pressure test, evacuate, dehydrate, charge, start-up, calibrate controls, and instruct Owner on operation and maintenance.

3.5 CLEANING

- A. Section 01 70 00 - Execution and Closeout Requirements: Requirements for cleaning.
- B. Vacuum clean coils and inside of cabinets.
- C. Install new throwaway filters in units at Substantial Completion.
- D. Turn over one complete set of filters to Owner upon final inspection and approval.

3.6 DEMONSTRATION

- A. Section 01 70 00 - Execution and Closeout Requirements: Requirements for demonstration and training.

- P. Controls: Microprocessor based controls, factory mounted with the following features:
1. Constant Volume Controls: To operate rooftop from space temperature sensor.
 - a. Furnish space temperature control with setpoint adjustment for control of unit and equipped with override button for programmed timed override of 2 hours.
 2. Control Functions: Furnish the following:
 - a. Unit scheduling.
 - b. Occupied-unoccupied mode.
 - c. Start-up and coast-down modes.
 - d. Nighttime free-cool purge mode.
 - e. Night setback.
 - f. Timed override.
 - g. Alarm shutdown.
 - h. Smoke control. Shut down when smoke detector is activated.
 3. Furnish the following setpoints and diagnostic functions accessible in unit control panel:
 - a. Unit operating mode.
 - b. Unit failure status.
 - c. Supply fan start-stop.
 - d. Return air temperature.
 - e. Cooling control.
 - f. Cooling status - all stages.
 - g. Heating control.
 - h. Heating status.
 - i. Number of stages activated.
 - j. Damper control.
 - k. Space temperature.
 - l. Filter status.
 - m. Smoke detector status.
- Q. Accessories:
1. Convenience Outlet: Factory installed, 115 volt, 15 amp, GFI type, internally mounted. Factory wired from transformer internal to unit.
 2. Disconnect Switch: Factory mounted, non-fused type, interlocked with access door, accessible from outside unit, with power lockout capability.

2.2 SOURCE QUALITY CONTROL

- A. Section 01 40 00 - Quality Requirements: Testing, inspection and analysis requirements.
- B. Perform factory test of each unit. Test includes:
1. Dynamic trim balance of completed fan assembly.
 2. Complete run check of electrical components and safety controls, including proper control sequencing.
 3. Pressure test, at manufacturer's rated pressure, of refrigerant coils and condenser coils prior to unit assembly.
 4. Leak check of completed refrigerant circuits.
 5. Compressor run check.

PART 3 EXECUTION

3.1 EXAMINATION

- A. Section 01 30 00 - Administrative Requirements: Coordination and project conditions.
- B. Verify roof curbs are installed and dimensions are as shown on shop drawings.

- B. Demonstrate unit operation and maintenance.
- C. Furnish services of manufacturer's technical representative for one 8 hour day to instruct Owner's personnel in operation and maintenance of units. Schedule training with Owner, provide at least 7 days notice to Owner and Architect/Engineer of training date.

END OF SECTION

SECTION 26 03 05

ELECTRICAL GENERAL REQUIREMENTS

PART 1 GENERAL

1.01 WORK INCLUDED

- A. Electrical work for this project will include all electrical work necessary to construct the new addition and to remodel and renovate designated existing portions of the building. Electrical work will include all power wiring, 120 volt and above, and certain low voltage wiring for communication systems. Power wiring will include all 120 volt power for any low voltage system including but not limited to the Fire Alarm system, and LAN/Telephone system.

1.02 CONTINUOUS OPERATION

- A. All existing buildings shall be occupied throughout the duration of construction. All electrical systems shall remain in use and in operation at all times. Notify library personnel before disrupting any electrical system. Minimize all outage durations. Make temporary connections to maintain electrical systems in use when extended outages are required.

1.03 APPLICABLE PUBLICATIONS

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

A. INSTITUTE OF ELECTRICAL AND ELECTRONICS ENGINEERS, INC. (IEEE)

IEEE 100 2000 Dictionary of Electrical and Electronics Terms

B. NATIONAL ELECTRICAL MANUFACTURERS ASSOCIATION (NEMA)

NEMA ICS 6 1993 (Rev. 2006) Enclosures for Industrial Control and Systems

NEMA MG 1 2006 (Rev. 2007) Motors and Generators

NEMA MG 10 2001 (Rev. 2007) Energy Management Guide for Selection and Use of Polyphase Motors

NEMA MG 11 1977 (Rev. 2007) Energy Management Guide of Selection and Use of Single-Phase Motors

C. NATIONAL FIRE PROTECTION ASSOCIATION (NFPA)

NFPA 70 2008 National Electrical Code

NFPA 101 2006 Life Safety Code

D. AMERICAN NATIONAL STANDARDS INSTITUTE (ANSI)

ANSI C2 2007 National Electrical Safety Code

E. CODE OF FEDERAL REGULATIONS (CFR)

29 CFR 1910.147 Control of Hazardous Energy (Lock Out/Tag Out)

F. FEDERAL SPECIFICATIONS (FS)

FS L-P-387 (Rev. A) (Int Am. 2) Plastic Sheet, Laminated, Thermosetting (for Design Plates)

G. Florida Building Code 2007 (with 2009 Supplement)

Chapter 4 Special Occupancy, Section 423 State Requirements for Educational Facilities

1.04 APPLICATION

- A. This section applies to all sections of Division 26, "Electrical," of this project except as specified otherwise in each individual section.

1.05 DEFINITION OF ELECTRICAL TERMS

- A. Unless otherwise specified or indicated, electrical terms used in these specifications, and on the drawings, shall be as defined in IEEE Standard No. 100.

1.06 SUBMITTALS

- A. Obtain approval before procurement, fabrication, or delivery of items to the job site. Partial submittals will not be acceptable and will be returned without review. Submittals shall include the manufacturer's name, trade name, place of manufacture, catalog model or number, nameplate data, size, layout dimensions, capacity, project specification and paragraph reference, applicable Federal, Military, industry, and technical society publication references, and other information necessary to establish contract compliance of each item to be furnished.
- B. Shop Drawings: In addition to the requirements specified elsewhere, shop drawings shall meet the following requirements. Drawings shall be a minimum of 8.5 inches by 11 inches in size, except as specified otherwise. Drawings shall include complete ratings information, wiring diagrams, and installation details of equipment indicating proposed location, layout and arrangement, control panels, accessories, piping, ductwork, and other items that must be shown to assure a coordinated installation. Wiring diagrams shall identify circuit terminals and indicate the internal wiring for each item of equipment and the interconnection between each item of equipment. Drawings shall indicate adequate clearance for operation, maintenance, and replacement of operating equipment devices. If equipment is disapproved, revise drawings to show acceptable equipment and resubmit.
- C. Manufacturer's Product Data: Submittals for each manufactured item shall be current manufacturer's descriptive literature of cataloged products, equipment drawings, diagrams, performance and characteristic curves, and catalog cuts.
- D. Submit only pages which are pertinent; mark each copy of standard printed data to identify pertinent products, referenced to Specification Section and Article number. Show reference standards, performance characteristics, and capacities; wiring and piping diagrams and controls; component parts; finishes; dimensions and required clearances.
- E. Modify manufacturer's standard schematic drawings and diagrams to supplement standard information and to provide information specifically applicable to the Work. Delete information not applicable.
- F. Publication Compliance: Where equipment or materials are specified to conform to industry and technical society publications of organizations such as American National Standards Institute (ANSI), American Society for Testing and Materials (ASTM), and Underwriters Laboratories Inc. (UL), submit proof of such compliance. The label or listing by the specified organization will be acceptable evidence of compliance. In each of the publications referred to

herein, consider the advisory provisions to be mandatory, as though the word "shall" had been substituted for "should" wherever it appears. In lieu of the label or listing, submit a certificate from an approved independent testing organization, adequately equipped and competent to perform such services, stating that the item has been tested in accordance with the specified organization's test methods and that the item conforms to the specified organization's publication.

- G. Certificates of Compliance: Submit manufacturer's certifications as required on products, materials, finish, and equipment indicated in the technical sections. Certifications shall be documents prepared specifically for this contract. Preprinted certifications and copies of previously submitted documents will not be acceptable. The manufacturer's certifications shall name the appropriate products, equipment, or materials and the publication specified as controlling the quality of that item. Certification shall not contain statements to imply that the item does not meet requirements specified, such as "as good as"; "achieve the same end use and results as materials formulated in accordance with the referenced publications"; or "equal or exceed the service and performance of the specified material." Certifications shall simply state that the item conforms to the requirements specified. Certificates shall be printed on the manufacturer's letterhead and shall be signed by the manufacturer's official authorized to sign certificates of compliance.

1.07 WARRANTY

- A. All equipment, material, accessories and installation shall carry a guarantee against defects and workmanship for a period of one year from the date of acceptance. Each system as a whole, and in all its parts, shall be guaranteed to function correctly up to the specified capacity. Should a system, or any part thereof, fail to meet the performance requirements, necessary replacements, alternations or repairs and required labor shall be made to bring performance up to specified requirements. Building construction finishes damaged or marred shall be restored to the satisfaction of the Owner's representative. All of the above described shall be done without cost to the Owner.
- B. Provide a warranty statement to be included in all Operations and Maintenance Manuals.
- C. Provide extended manufacturer's warranties where required by specific technical sections of these specifications.
- D. Where extended guarantees are called for herein, provide a warranty statement detailing the extended guarantees and length coverage for each required system(s) to be included in all Operations and Maintenance Manuals.
- E. Warranty maintenance shall be provided by the Contractor during his normal working hours at no expense to the Owner.
- F. This warranty shall not apply if damage is caused by abuse, accident, improper operation, or negligence.

1.08 OPERATION AND MAINTENANCE MANUAL

- A. Submit as required for systems and equipment indicated in the technical sections. Furnish five copies, bound in hardback binders or an approved equivalent. Furnish one complete manual prior to performance of systems or equipment tests, and furnish the remaining manuals prior to contract completion. Inscribe the following identification on the cover: the words "OPERATION AND MAINTENANCE MANUAL," the name and location of the system, equipment, building, name of Contractor, and contract number. Include in the manual the names, addresses, and telephone numbers of each subcontractor installing the system or equipment and the local representatives for the system or equipment. Include a table of contents and assemble the manual to conform to the table of contents, with the tab sheets placed before instructions covering the subject. The instructions shall be legible and easily read, with large sheets of

- B. Demonstrate unit operation and maintenance.
- C. Furnish services of manufacturer's technical representative for one 8 hour day to instruct Owner's personnel in operation and maintenance of units. Schedule training with Owner, provide at least 7 days notice to Owner and Architect/Engineer of training date.

END OF SECTION

SECTION 26 03 05

ELECTRICAL GENERAL REQUIREMENTS

PART 1 GENERAL

1.01 WORK INCLUDED

- A. Electrical work for this project will include all electrical work necessary to construct the new addition and to remodel and renovate designated existing portions of the building. Electrical work will include all power wiring, 120 volt and above, and certain low voltage wiring for communication systems. Power wiring will include all 120 volt power for any low voltage system including but not limited to the Fire Alarm system, and LAN/Telephone system.

1.02 CONTINUOUS OPERATION

- A. All existing buildings shall be occupied throughout the duration of construction. All electrical systems shall remain in use and in operation at all times. Notify library personnel before disrupting any electrical system. Minimize all outage durations. Make temporary connections to maintain electrical systems in use when extended outages are required.

1.03 APPLICABLE PUBLICATIONS

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

A. INSTITUTE OF ELECTRICAL AND ELECTRONICS ENGINEERS, INC. (IEEE)

IEEE 100 2000 Dictionary of Electrical and Electronics Terms

B. NATIONAL ELECTRICAL MANUFACTURERS ASSOCIATION (NEMA)

NEMA ICS 6 1993 (Rev. 2006) Enclosures for Industrial Control and Systems

NEMA MG 1 2006 (Rev. 2007) Motors and Generators

NEMA MG 10 2001 (Rev. 2007) Energy Management Guide for Selection and Use of Polyphase Motors

NEMA MG 11 1977 (Rev. 2007) Energy Management Guide of Selection and Use of Single-Phase Motors

C. NATIONAL FIRE PROTECTION ASSOCIATION (NFPA)

NFPA 70 2008 National Electrical Code

NFPA 101 2006 Life Safety Code

D. AMERICAN NATIONAL STANDARDS INSTITUTE (ANSI)

ANSI C2 2007 National Electrical Safety Code

E. CODE OF FEDERAL REGULATIONS (CFR)

29 CFR 1910.147 Control of Hazardous Energy (Lock Out/Tag Out)

drawings folded in. The manual shall include:

1. Internal and interconnecting wiring and control diagrams with data to explain detailed operation and control of the system or equipment.
2. A control sequence describing startup, operation, and shutdown.
3. Description of the function of each principal item of equipment.
4. Installation and maintenance instructions.
5. Safety precautions.
6. Diagrams and illustrations.
7. Testing methods.
8. Performance data.
9. Lubrication schedule including type, grade, temperature range, and frequency.
10. Parts list: The list shall indicate sources of supply, recommended spare parts, and name of servicing organization.
11. Appendix: List qualified permanent servicing organizations for support of the equipment, including addresses and certified qualifications.

1.09 POSTED OPERATING INSTRUCTIONS

- A. Furnish approved operating instructions for systems and equipment indicated in the technical sections for use by operation and maintenance personnel. The operating instructions shall include wiring diagrams, control diagrams, and control sequence for each principal system and equipment. Print or engrave operating instructions and frame under glass or in approved laminated plastic. Post instructions as directed. Attach or post operating instructions adjacent to each principal system and equipment including startup, proper adjustment, operating, lubrication, shutdown, safety precautions, procedure in the event of equipment failure, and other items of instruction as recommended by the manufacturer of each system or equipment. Provide weather-resistant materials or weatherproof enclosures for operating instructions exposed to the weather. Operating instructions shall not fade when exposed to sunlight and shall be secured to prevent easy removal or peeling.

1.10 DELIVERY AND STORAGE

- A. Handle, store, and protect equipment and materials in accordance with the manufacturer's recommendations and with the requirements of NFPA 70B, Appendix I, titled "Equipment Storage and Maintenance During Construction." Replace damaged or defective items with new items.

1.11 CATALOGED PRODUCTS/SERVICE AVAILABILITY

- A. Materials and equipment shall be current products by manufacturers regularly engaged in the production of such products. Products shall have been in satisfactory commercial or industrial use for 2 years prior to bid opening. The 2-year period shall include applications of equipment and materials under similar circumstances and of similar size. The 2-year period shall be satisfactorily completed by a product for sale on the commercial market through advertisements, manufacturers' catalogs, or brochures. Products having less than a 2-year field service record will be acceptable if a certified record of satisfactory field operation for not less than 6000 hours, exclusive of the manufacturers' factory or laboratory tests, is furnished. The equipment items shall be supported by service organizations which are reasonably convenient to the equipment installation in order to render satisfactory service to the equipment on a regular and emergency basis during the warranty period of the contract.

1.12 MANUFACTURER'S INSTRUCTIONS

- A. Where installation procedures or any part thereof are required to be in accordance with manufacturer's instructions, furnish printed copies of the instructions prior to installation. Installation of the item shall not proceed until instructions are received. Failure to furnish instructions shall be cause for rejection of the equipment or material.

- B. Comply with instructions in full detail, including each step in sequence. Should instructions conflict with Contract Documents, request clarification from Architect/Engineer before proceeding.

1.13 MOTORS AND MOTOR CONTROLS FOR MECHANICAL EQUIPMENT

- A. The electrical components of mechanical equipment, such as motors, motor starters, control or push-button stations, float or pressure switches, solenoid valves, and other devices functioning to control mechanical equipment, and control wiring and conduit for circuits rated 100 volts or less, are specified in the section covering the associated mechanical equipment, rather than in Division 26. The interconnecting power wiring and conduit, control wiring rated 120 volts (nominal) and conduit, and the electrical power circuits shall be furnished and installed under Division 26.

1.14 AS BUILT DRAWINGS

- A. Maintain one complete set of drawings on the job site for the purpose of recording changes and modifications in the Contract Documents. Do not use the job set for any purpose except entry of new data.
- B. Using an erasable colored pencil (not ink or indelible pencil), clearly and accurately record all changes to the construction. Locate all conduits, circuits, junction boxes, pull boxes, panels, starters and similar items where different from that shown on the Contract Documents and where not shown. Clearly indicate the location of any junction containing splices, taps or terminations. Date all entries.
- C. At a time nearing the completion of the work, complete all changes to the job set of drawings and forward the drawings to the Architect/Engineer for review and approval.
- D. The work shall not be considered substantially complete until As-Built Drawings are submitted for review.

PART 2 PRODUCTS

2.01 MATERIALS AND EQUIPMENT

- A. All materials, equipment, and devices shall, as a minimum, meet the requirements of UL where UL standards are established for those items, and the requirements of NFPA 70. All items shall be new unless specified or indicated otherwise.

PART 3 EXECUTION

3.01 MATERIAL AND EQUIPMENT

- A. All material and equipment shall, as a minimum, be installed in accordance with NFPA 70, National Electrical Code.

3.02 PAINTING OF EQUIPMENT

- A. Factory Applied: Electrical equipment shall have factory-applied painting systems which shall, as a minimum, meet the requirements of NEMA ICS 6 corrosion-resistance test, except equipment specified to meet requirements of ANSI C37.20 shall have a finish as specified in ANSI C37.20.
- B. Field Applied: Paint electrical equipment as required to match finish or to meet safety criteria.

3.03 AS-BUILT DRAWINGS

- A. Submit As-Built Drawings for review and approval at or before Substantial Completion Inspection.

END OF SECTION

SECTION 26 03 07

MINOR ELECTRICAL DEMOLITION FOR REMODELING

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Electrical demolition.

PART 2 PRODUCTS

2.01 MATERIALS AND EQUIPMENT

- A. Materials and Equipment for Patching and Extending Work: As specified in individual Sections.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Verify that field measurements and circuiting arrangements are as shown on Drawings.
- B. Verify that abandoned wiring and equipment serve only abandoned facilities.
- C. Demolition Drawings are based on casual field observation. Report discrepancies to Architect/Engineer before disturbing existing installation.
- D. Beginning of demolition means installer accepts existing conditions.

3.02 PREPARATION

- A. Disconnect electrical systems scheduled for removal.
- B. Coordinate utility service outages with Utility Company.
- C. Provide temporary wiring and connections to maintain existing systems (e.g. fire alarm, intercom, etc.) in service during construction. When work must be performed on energized equipment or circuits, use personnel experienced in such operations.
- D. Existing Electrical Service: Maintain existing system in service at all times. Obtain permission from Owner at least 24 hours before making any change to existing systems. Minimize outage duration. Make temporary connections to maintain service in areas adjacent to work area.

3.03 DEMOLITION AND EXTENSION OF EXISTING ELECTRICAL WORK

- A. Demolish and extend existing electrical work under provisions of this Section.
- B. Remove, relocate, and extend existing installations to accommodate new construction.
- C. Remove abandoned wiring to source of supply.
- D. Remove exposed abandoned conduit, including abandoned conduit above accessible ceiling finishes. Cut conduit flush with walls and floors, and patch surfaces.
- E. Disconnect and remove abandoned luminaries. Remove brackets, stems, hangers, and other accessories.
- F. Repair adjacent construction and finishes damaged during demolition and extension work.

EXHIBIT "A"

- G. Extend existing installations using materials and methods compatible with existing electrical installations, or as specified.

END OF SECTION

SECTION 26 05 19

WIRE AND CABLE

PART 1 GENERAL

1.01 WORK INCLUDED

- A. Building wire.
- B. Metal Clad Cable
- C. Wiring connections and terminations.

1.02 REFERENCES

- A. NEMA WC 3 - Rubber-Insulated Wire and Cable for the Transmission and Distribution of Electrical Energy.
- B. NEMA WC 5 - Thermoplastic-Insulated Wire and Cable for the Transmission and Distribution of Electrical Energy.

1.03 SUBMITTALS

- A. Submit shop drawings and product data under the provisions of Section 26 03 05.
- B. Submit manufacturer's instructions.

PART 2 PRODUCTS

2.01 BUILDING WIRE

- A. Thermoplastic-insulated Building Wire: NEMA WC 5.
- B. Feeders and Branch Circuits Larger Than 6 AWG: Copper, stranded conductor, 600 volt insulation, THWN.
- C. Feeders and Branch Circuits 6 AWG and Smaller: Copper conductor, 600 volt insulation, THWN 6 and 8 AWG, stranded conductor; smaller than 8 AWG, solid conductor.
- D. Control Circuits: Copper, stranded conductor 600 volt insulation, THW.

2.02 REMOTE CONTROL AND SIGNAL CABLE

- A. Control Cable for Class 1 Remote Control and Signal Circuits: Copper conductor, 600 volt insulation, rated 75 degree C, individual conductors twisted together and covered with aluminum sheath, and overall PVC jacket.
- B. Control Cable for Class 2 or Class 3 Remote Control and Signal Circuits: Copper conductor, 300 volt insulation, rated 75 degree C, individual conductors twisted together and covered with a PVC jacket; UL listed.

2.03 METAL CLAD CABLE

- A. Conductor: Copper. Do not use aluminum.
- B. Insulation Voltage Rating: 600 volts.
- C. Insulation Temperature Rating: 75 degrees C.

- D. Insulation Material: Thermoplastic.
- E. Armor Material: Steel.
- F. Armor Design: Corrugated tube.
- G. Jacket: None.

PART 3 EXECUTION

3.01 GENERAL WIRING METHODS

- A. Use no wire smaller than 12 AWG for power and lighting circuits, and no smaller than 14 AWG for control wiring.
- B. Use 10 AWG conductor for 20 ampere, 120 volt branch circuit home runs longer than 75 feet and 277 volt branch circuit home runs longer than 200 feet.
- C. Place an equal number of conductors for each phase of a circuit in same raceway or cable.
- D. Splice only in junction or outlet boxes.
- E. Neatly train and lace wiring inside boxes, equipment, and panelboards.
- F. Make Conductor lengths for parallel circuits equal.
- G. Provide a separate neutral conductor for every circuit requiring a neutral. "Common" neutrals shall not be installed.
- H. Provide a separate grounding conductor in every raceway. Provide a separate grounding conductor for every feeder and branch circuit. Multiple ground conductors are required where more than one circuit is installed in a common raceway. "Common" ground conductors shall not be installed.

3.02 WIRING INSTALLATION IN RACEWAYS

- A. Pull all conductors into a raceway at the same time. Use UL listed wire pulling lubricate for pulling 4 AWG and larger wires.
- B. Install wire in raceway after interior of building has been physically protected from the weather and all mechanical work likely to injure conductors has been completed.
- C. Completely and thoroughly swab raceway system before installing conductors.
- D. Use solderless pressure connectors with insulating covers for copper wire splices and taps, 8 AWG and smaller. For 10 AWG and smaller, use insulated spring wire connectors with plastic caps.
- E. Use compression connectors for copper wire splices and taps, 6 AWG and larger. Tape uninsulated conductors and connectors with electrical tape to 150 percent of the insulation value of conductor.
- F. Thoroughly clean wires before installing lugs and connectors.
- G. Make splices, taps and terminations to carry full ampacity of conductors without perceptible temperature rise.
- H. Terminate spare conductors with electrical tape.
- I. All splices, taps and terminations of any Fire Alarm conductors shall be made using binder head

screw terminals only.

3.03 CABLE WIRING TECHNIQUES

- A. Wiring in raceways may be converted to metal clad cable above accessible ceilings. Do not install metal clad cable in walls, under floors or underground or above hard ceilings.
- B. Protect exposed cable from damage.
- C. Support cables above accessible ceiling, using spring metal clips to support cables from structural members. Do not rest cable on ceiling panels.
- D. Use suitable cable fittings and connectors.

3.04 WIRE COLOR

- A. General
 - 1. For wire sizes 10 AWG and smaller, install wire colors in accordance with the following:
 - a. Black, red, and blue for circuits at 120/208 volts single or three phase.
 - 2. For wire sizes 8 AWG and larger, identify wire with colored tape at terminals, splices and boxes. Colors are as follows:
 - a. Black, red, and blue for circuits at 120/208 volts single or three phase.
- B. Neutral Conductors: White. When two or more neutrals are located in one conduit, individually identify each with proper circuit number.
- C. Branch Circuit Conductors: Install three or four wire home runs with each phase uniquely color coded.
- D. Feeder Circuit Conductors: Uniquely color code each phase.
- E. Ground Conductors:
 - 1. For 6 AWG and smaller: Green.
 - 2. For 4 AWG and larger: Identify with green tape at both ends and visible points including junction boxes.

3.05 FIELD QUALITY CONTROL

- A. Inspect wire and cable for physical damage and proper connection.
- B. Perform continuity test on all power and equipment branch circuit conductors. Verify proper phasing connections.

3.06 WIRE AND CABLE INSTALLATION SCHEDULE

- A. Use building wire in raceways in all exposed locations and in all locations concealed by permanently installed materials.
- B. Metal clad cable may be used above accessible ceilings only.

END OF SECTION

SECTION 26 05 26

SECONDARY GROUNDING

PART 1 GENERAL

1.01 WORK INCLUDED

- A. Power system grounding.
- B. Communication system grounding.
- C. Electrical equipment and raceway grounding and bonding.
- D. Grounding Systems Testing.

1.02 SYSTEM DESCRIPTION

- A. Ground the electrical service system neutral at service entrance equipment to supplementary grounding electrodes.
- B. Bond together system neutrals, service equipment enclosures, exposed non-current carrying metal parts of electrical equipment, metal raceway systems, grounding conductor in raceways and cables, receptacle ground connectors, and plumbing systems.

1.03 SUBMITTALS

- A. Submit shop drawings under provisions of Section 26 03 05.
- B. Submit grounding electrode test results in tabulated format at substantial completion
- C. Indicate location of system grounding electrode connections, and routing of grounding electrode conductor.

1.04 QUALITY ASSURANCE

- A. Compliance: Testing shall be accomplished by an independent testing firm and comply to the following standards:
 - 1. NEMA
 - 2. NETA
 - 3. NFPA
 - 4. IEEE
- B. Qualification: The testing firm shall be an independent testing organization which can function as an unbiased testing authority, professionally independent of the manufacturers, supplier, and installers of equipment or systems evaluated by the testing firm.
- C. Experience: The testing firm shall be regularly engaged in the testing of electrical equipment devices, installations, and systems.
- D. Accreditation: The testing firm shall meet OSHA criteria for accreditation of testing laboratories, Title 29, Part 1907, or be a Full Member Company of the International Electrical Testing Association.
- E. Certification: The lead, on-site, technical person shall be currently certified by the International Electrical Testing Association (NETA) or National Institute for Certification in Engineering Technologies (NICET) in electrical power distribution system testing.
- F. Personnel: The testing firm shall utilize engineers and technicians who are regularly employed

by the firm for testing services.

- G. Proof of Qualifications: The testing firm shall submit proof of the above qualifications when requested.

PART 2 PRODUCTS

2.01 MATERIALS

- A. Ground Rods: Copper-encased steel, 3/4 inch diameter, minimum length 10 feet.

2.02 EQUIPMENT

- A. Instruments: Supply all instruments required to read and record data. Calibration date shall be submitted on test reports.
- B. Adjustments: Adjust system to operate at the required performance levels within all tolerances as required NETA standards.

PART 3 EXECUTION

3.01 INSTALLATION

- A. Provide a separate, insulated equipment grounding conductor in every raceway. Provide a separate grounding conductor for every feeder and branch circuit. Multiple ground conductors are required where more than one circuit is installed in a common raceway. "Common" ground conductors shall not be installed. Terminate each end on a grounding lug, bus, or bushing.
- B. Provide three (3) twenty foot (20) supplementary grounding electrodes a minimum of six (6) feet apart near the service entrance location. Connect the electrodes to the service system using copper conductor in nonmetallic conduit in accordance with the National Electrical Code.
- C. Connect grounding electrode conductors to supplementary grounding electrodes using exothermically welded connections after grounding electrode test are complete.
- D. Connect grounding conductors to interior metal water pipes using suitable ground clamps, using copper conductor in accordance with the National Electrical Code.
- E. Use minimum 6 AWG copper conductor for communications service grounding conductor. Leave 10 feet slack conductor at terminal board.

3.02 FIELD QUALITY CONTROL

- A. Inspect grounding and bonding system conductors and connections for tightness and proper installation.
- B. Electrode Ground: The resistance of all electrodes (main services, generators, transformer, etc.) shall not exceed 25 ohms and shall be measured by the testing firm before conductors are connected and before equipment is placed in operation. Any measurement exceeding 5 ohms shall be reported to the Owner and direction from the Owner shall be received before any final connections are made. Testing shall be performed on all grounding electrode installations. Testing shall be conducted by the three (3) point fall-of-potential method in accordance with IEEE Standard No. 81-1983, Section 9.04. Ground tests shall be performed on each electrode before conductor connections are made. If measured resistance is below 5 ohms all conductors shall be connected and the entire grounding electrode system shall be tested. Submit all ground test readings in tabulated format within one week of ground test(s).
- C. Electrical Contractor shall engage an independent testing company to perform the ground testing. The Electrical Contractor shall not perform the ground testing.

END OF SECTION

SECTION 26 05 29

SUPPORTING DEVICES

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Conduit and equipment supports.
- B. Anchors and fasteners.

1.02 REFERENCES

- A. NECA - National Electrical Contractors Association.
- B. ANSI/NFPA 70 - National Electrical Code.

1.03 SUBMITTALS

- A. Submit under provisions of Section 26 03 05.
- B. Product Data: Provide manufacturer's catalog data for fastening systems.
- C. Manufacturer's Instructions: Indicate application conditions and limitations of use stipulated by Product testing agency specified under Regulatory Requirements. Include instructions for storage, handling, protection, examination, preparation, installation, and starting of Product.

1.04 REGULATORY REQUIREMENTS

- A. Conform to requirements of ANSI/NFPA 70.
- B. Furnish products listed and classified by Underwriters Laboratories, Inc. as suitable for purpose specified and shown.

PART 2 PRODUCTS

2.01 PRODUCT REQUIREMENTS

- A. Materials and Finishes: Provide adequate corrosion resistance.
- B. Provide materials, sizes, and types of anchors, fasteners and supports to carry the loads of equipment and conduit. Consider weight of wire in conduit when selecting products.
- C. Anchors and Fasteners:
 - 1. Concrete Structural Elements: Use precast insert system, expansion anchors and preset inserts.
 - 2. Steel Structural Elements: Use beam clamps, spring steel clips and welded fasteners.
 - 3. Concrete Surfaces: Use expansion anchors.
 - 4. Hollow Masonry, Plaster, and Gypsum Board Partitions: Use toggle bolts.
 - 5. Solid Masonry Walls: Use expansion anchors and preset inserts.
 - 6. Sheet Metal: Use sheet metal screws.
 - 7. Wood Elements: Use wood screws.

2.02 STEEL CHANNEL

- A. Description: Galvanized steel in exterior locations, painted steel for interior applications.

PART 3 EXECUTION

3.01 INSTALLATION

- A. Install products in accordance with manufacturer's instructions.
- B. Provide anchors, fasteners, and supports in accordance with NECA "Standard of Installation".
- C. Do not fasten supports to pipes, ducts, mechanical equipment, and conduit.
- D. Do not use powder-actuated anchors.
- E. Do not drill or cut structural members.
- F. Fabricate supports from structural steel or steel channel. Rigidly weld members or use hexagon head bolts to present neat appearance with adequate strength and rigidity. Use spring lock washers under all nuts.
- G. Install surface-mounted cabinets and panelboards with minimum of four anchors.
- H. In wet and damp locations use steel channel supports to stand cabinets and panelboards one inch off wall.
- I. Use sheet metal channel to bridge studs above and below cabinets and panelboards recessed in hollow partitions.
- J. Use galvanized steel channel to construct electrical equipment supports for all exterior mounted equipment that cannot be fastened to a building wall. Use a minimum of two (2) vertical channels with additional horizontal channels where multiple disconnects, starters or where a panelboard is installed. Set vertical members in concrete foundation or anchor to equipment slabs with galvanized angle brackets and 3/8 stainless steel bolts and expansion anchors, minimum of 2 per member.

END OF SECTION

SECTION 26 05 32

CONDUIT

PART 1 GENERAL

1.01 WORK INCLUDED:

- A. Rigid metal conduit and fittings.
- B. Electrical metallic tubing and fittings.
- C. Electrical non-metallic conduit
- D. Flexible metal conduit and fittings.
- E. Liquidtight flexible metal conduit and fittings.
- F. Surface metal raceways.

1.02 REFERENCES

- A. ANSI C80.1 - Rigid Steel Conduit, Zinc-Coated.
- B. ANSI C80.3 - Electrical Metallic Tubing, Zinc-Coated.
- C. ANSI/NEMA FB 1 - Fittings and Supports for Conduit and Cable Assemblies.
- D. NEMA TC 2 - Electrical Polyvinyl Chloride (PVC) Tubing and Conduit.
- E. NEMA TC 3 - PVC Fittings for Use with Rigid PVC Conduit and Tubing.

1.03 SUBMITTALS

- A. Submit under provisions of Section 26 03 05.
- B. Product Data: Provide for all conduit types, fittings, conduit bodies, surface metal raceways and accessory fittings and device boxes.
- C. Submit product data for the following :
 - 1. Flexible metal conduit.
 - 2. Liquidtight flexible metal conduit.
 - 3. Nonmetallic conduit.
 - 4. Flexible nonmetallic conduit.
 - 5. Raceway fittings.
 - 6. Conduit bodies.
 - 7. Surface raceway.
 - 8. Wireway.
 - 9. Pull and junction boxes.
 - 10. Handholes.

PART 2 PRODUCTS

2.01 RIGID METAL CONDUIT AND FITTINGS

- A. Rigid Steel Conduit: ANSI C80.1.
- B. Fittings and Conduit Bodies: ANSI/NEMA FB 1; threaded type, material to match conduit.

2.02 ELECTRICAL METALLIC TUBING (EMT) AND FITTINGS

- A. EMT: ANSI C80.3. Galvanized tubing.
- B. Fittings and Conduit Bodies: ANSI/NEMA FB 1; steel or malleable iron, compression type.

2.03 FLEXIBLE METAL CONDUIT AND FITTINGS

- A. Conduit: FS WW-C-566; steel.
- B. Fittings and Conduit Bodies: ANSI/NEMA FB 1.

2.04 LIQUIDTIGHT FLEXIBLE CONDUIT AND FITTINGS

- A. Conduit: Flexible metal conduit with PVC jacket.
- B. Fittings and Conduit Bodies: ANSI/NEMA FB 1.

2.05 NONMETALLIC CONDUIT

- A. Description: NEMA TC 2; Schedule 40 PVC.
- B. Fittings and Conduit Bodies: NEMA TC 3.

2.06 CONDUIT SUPPORTS

- A. Conduit Clamps, Straps, and Supports: Steel or malleable iron.

2.07 SURFACE METAL RACEWAY

- A. Manufacturers:
 - 1. The Legrand Wiremold Co. Series 2000 metal raceway.
 - 2. Substitutions: Not Permitted.
- B. Product Description: Sheet metal channel with fitted cover, suitable for use as surface metal raceway.
- C. Nominal Size: 1-1/4 x 3/4 inch.
- D. Finish: Buff enamel.
- E. Fittings, Boxes, and Extension Rings: Furnish manufacturer's standard accessories; match finish on raceway.

PART 3 EXECUTION

3.01 CONDUIT SIZING, ARRANGEMENT AND SUPPORT

- A. Install conduit in accordance with NECA "Standard of Installation."
- B. Install nonmetallic conduit in accordance with manufacturer's instructions.
- C. Size conduit for conductor type installed or for Type THWN conductors, whichever is larger; 1/2 inch minimum size.
- D. Arrange conduit to maintain headroom and present a neat appearance.
- E. Route exposed conduit and conduit above accessible ceilings parallel and perpendicular to walls and adjacent piping.
- F. Maintain minimum 6 inch clearance between conduit and piping. Maintain 12 inch clearance between conduit and heat sources such as flues, steam pipes, and heating appliances.
- G. Arrange conduit supports to prevent distortion of alignment by wire pulling operations. Fasten conduit using galvanized straps, lay-in adjustable hangers, clevis hangers, or bolted split stamped galvanized hangers.
- H. Group conduit in parallel runs where practical and use conduit rack constructed of steel channel with conduit straps or clamps. Provide space for 25 percent additional conduit.
- I. Do not fasten conduit with wire or perforated pipe straps. Remove all wire used for temporary conduit support during construction, before conductors are pulled.
- J. Support conduit at a maximum of 7 feet on center.
- K. Do not use flexible conduit in lengths exceeding six feet.

3.02 CONDUIT INSTALLATION

- A. All conduit in finished spaces and normally occupied spaces shall be concealed where ever possible. Where conduit cannot be concealed, use surface metal raceway and manufacturer's standard accessory fittings and device boxes.
- B. Cut conduit square using a saw or pipecutter; de-burr cut ends.
- C. Bring conduit to the shoulder of fittings and couplings and fasten securely.
- D. Join nonmetallic conduit using cement as recommended by manufacturer. Wipe nonmetallic conduit dry and clean before joining. Apply full even coat of cement to entire area inserted in fitting. Allow joint to cure for 20 minutes, minimum.
- E. Use conduit hubs or sealing locknuts for fastening conduit to cast boxes, and for fastening conduit to sheet metal boxes in damp or wet locations.
- F. Install no more than the equivalent of three 90-degree bends between boxes.
- G. Use conduit bodies to make sharp changes in direction, as around beams.
- H. Use hydraulic one-shot conduit bender or factory elbows for bends in conduit larger than 2 inch size.
- I. Avoid moisture traps where possible; where unavoidable, provide junction box with drain

fitting at conduit low point.

- J. Use suitable conduit caps to protect installed conduit against entrance of dirt and moisture.
- K. Provide No. 12 AWG insulated conductor or suitable pull string in empty conduit, except sleeves and nipples.
- L. Install expansion joints where conduit crosses building expansion joints.
- M. Where conduit penetrates fire-rated walls and floors, provide mechanical fire-stop fittings with UL listed fire rating equal to wall or floor rating.
- N. Route conduit through roof openings for piping and ductwork where possible; otherwise, route through roof jack with pitch pocket.
- O. Maximum Size Conduit in Slabs Above Grade: 1" inch. Do not route conduits to cross each other in slabs above grade.
- P. Surface Raceway: Install flat-head screws, clips, and straps to fasten raceway channel to surfaces; mount plumb and level. Install insulating bushings and inserts at connections to outlets and corner fittings.

3.03 CONDUIT INSTALLATION SCHEDULE

- A. Underground Installations For Service Entrance and Building Feeder Conductors: Galvanized rigid steel conduit coated with asphaltum paint after fabrication/installation and prior to backfilling or PVC conduit encased in minimum 3" thickness concrete all around.
- B. Underground Installations and in Concrete Slabs: Schedule 40 PVC nonmetallic conduit. Convert PVC to metallic conduit including any elbows before rising through concrete slabs and continue metallic conduit to electrical enclosures.
- C. Exposed Outdoor Locations: Rigid steel conduit.
- D. Wet Interior Locations: Rigid steel conduit.
- E. Concealed Dry Interior Locations: Inside walls and above ceilings; Electrical metallic tubing.
- F. Exposed Dry Interior Locations: In mechanical and electrical rooms and similar utility spaces; Any conduit meeting NEC requirements. In finished spaces and normally occupied spaces; Surface metal raceway.

3.04 PAINTING

- A. All conduit shall be field painted to match the adjacent wall color where walls are painted.
- B. Surface metal raceway shall be manufacturer's standard painted finish.
- C. All conduit containing fire alarm conductors shall be painted red.

END OF SECTION

SECTION 26 05 33

BOXES

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Wall and ceiling outlet boxes.
- B. Pull and junction boxes.

1.02 RELATED SECTIONS

- A. Section 26 27 26 - Wiring Devices: Wall plates in finished areas and access floor boxes.

1.03 REFERENCES

- A. NECA - Standard of Installation.
- B. NEMA FB 1 - Fittings and Supports for Conduit and Cable Assemblies.
- C. NEMA OS 1 - Sheet-steel Outlet Boxes, Device Boxes, Covers, and Box Supports.
- D. NEMA 250 - Enclosures for Electrical Equipment (1000 Volts Maximum).
- E. NFPA 70 - National Electrical Code.

1.04 SUBMITTALS FOR REVIEW

- A. Submit shop drawings and product data under the provisions of Section 26 03 05.

1.05 SUBMITTALS FOR CLOSEOUT

- A. Section 01 78 00 - Closeout Submittals: Operation and Maintenance Data submittals for Project closeout.
- B. Record actual locations and mounting heights of outlet, pull, and junction boxes on project record documents.

1.06 REGULATORY REQUIREMENTS

- A. Conform to requirements of NFPA 70.
- B. Provide Products listed and classified by Underwriters Laboratories, Inc., as suitable for the purpose specified and indicated.

PART 2 PRODUCTS

2.01 OUTLET BOXES

- A. Sheet Metal Outlet Boxes: NEMA OS 1, galvanized steel.
- B. Luminaire and Equipment Supporting Boxes: Rated for weight of equipment supported; include 1/2 inch (13 mm) male fixture studs where required.
- C. Concrete Ceiling Boxes: Concrete type.
- D. Cast Boxes: NEMA FB 1, Type FD, cast fer alloy. Provide gasketed cover by box manufacturer.

Provide threaded hubs.

E. Wall Plates for Finished Areas: As specified in Section 26 27 26.

2.02 PULL AND JUNCTION BOXES

A. Sheet Metal Boxes: NEMA OS 1, galvanized steel.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify locations of floor boxes and outlets in offices, and work areas prior to rough-in.

3.02 INSTALLATION

- A. Install boxes in accordance with NECA "Standard of Installation."
- B. Install in locations as shown on Drawings, and as required for splices, taps, wire pulling, equipment connections and compliance with regulatory requirements.
- C. Set wall mounted boxes at elevations to accommodate mounting heights specified in section for outlet device.
- D. Electrical boxes are shown on Drawings in approximate locations unless dimensioned. Adjust box location up to 3 feet if required to accommodate intended purpose.
- E. Orient boxes to accommodate wiring devices oriented as specified in Section 26 27 26.
- F. Maintain headroom and present neat mechanical appearance.
- G. Install pull boxes and junction boxes above accessible ceilings and in unfinished areas only.
- H. Inaccessible Ceiling Areas: Install outlet and junction boxes no more than 6 inches (150 mm) from ceiling access panel or from removable recessed luminaire.
- I. Install boxes to preserve fire resistance rating of partitions and other elements.
- J. Coordinate mounting heights and locations of outlets mounted above counters, benches, and backsplashes.
- K. Locate outlet boxes to allow luminaires positioned as shown on reflected ceiling plan.
- L. Align adjacent wall mounted outlet boxes for switches, thermostats, and similar devices.
- M. Use flush mounting outlet box in finished areas.
- N. Locate flush mounting box in masonry wall to require cutting of masonry unit corner only. Coordinate masonry cutting to achieve neat opening.
- O. Do not install flush mounting box back-to-back in walls; provide minimum 6 inches (150 mm) separation. Provide minimum 24 inches (600 mm) separation in acoustic rated walls.
- P. Secure flush mounting box to interior wall and partition studs. Accurately position to allow for surface finish thickness.
- Q. Use stamped steel bridges to fasten flush mounting outlet box between studs.
- R. Install flush mounting box without damaging wall insulation or reducing its effectiveness.

- S. Use adjustable steel channel fasteners for hung ceiling outlet box.
- T. Do not fasten boxes to ceiling support wires.
- U. Support boxes independently of conduit.
- V. Use gang box where more than one device is mounted together. Do not use sectional box.
- W. Use gang box with plaster ring for single device outlets.
- X. Use cast outlet box with gasket cover in exterior locations and wet locations.
- Y. Use cast floor boxes for installations in slab on grade; formed steel boxes are acceptable for other installations.
- Z. Set floor boxes level.
- AA. Large Pull Boxes: Use NEMA 1 hinged enclosure in interior dry locations, and NEMA 3R hinged enclosure in other locations.

3.03 ADJUSTING

- A. Adjust floor box flush with finish flooring material.
- B. Adjust flush-mounting outlets to make front flush with finished wall material.
- C. Install knockout closures in unused box openings.

3.04 CLEANING

- A. Clean interior of boxes to remove dust, debris, and other material.
- B. Clean exposed surfaces and restore finish.

3.05 PAINTING

- A. Paint all junction boxes to match adjacent wall color where walls are painted.
- B. Paint all junction boxes containing fire alarm conductors red.

END OF SECTION

SECTION 26 05 34

FLOOR BOXES

PART 1 GENERAL

1.01 SUMMARY

- A. Section includes floor boxes; floor box service fittings; poke-through fittings; and access floor boxes.
- B. Related Sections:
 - 1. Section 26 05 29 - Supporting Devices.
 - 2. Section 26 05 33 - Raceway and Boxes.
 - 3. Section 26 27 26 - Wiring Devices: Receptacles for installation in floor boxes.

1.02 REFERENCES

- A. National Electrical Manufacturers Association:
 - 1. NEMA OS 1 - Sheet Steel Outlet Boxes, Device Boxes, Covers, and Box Supports.

1.03 SUBMITTALS

- A. Section 26 03 05 - Submittal Procedures: Submittal procedures.
- B. Product Data: Submit catalog data for floor boxes and service fittings.

1.04 CLOSEOUT SUBMITTALS

- A. Section 26 03 05 - Execution Requirements: Closeout procedures.
- B. Project Record Documents: Record actual locations of each floor box and poke-through fitting.

1.05 QUALIFICATIONS

- A. Manufacturer: Company specializing in manufacturing products specified in this section with minimum three years experience.

PART 2 PRODUCTS

2.01 FLOOR BOXES

- A. Floor Boxes shall be of the concealed service type. Provide units with flush, hinged covers that conceal all wiring connections. Covers shall accept carpet or tile inserts. Exposed trim shall be metal, brushed aluminum or brass in color.
- B. Floor Boxes shall be sized to allow the installation of two (2) duplex, 120 volt convenience receptacles and two (2) duplex, telephone/data communications receptacles.
- C. Material: Cast metal.
- D. Shape: Rectangular.
- E. Service fittings and devices: As specified in Section 26 27 26.
- F. Floor Boxes shall be Walker RFB Series or approved equal.

2.02 PEDESTAL-TYPE CONVENIENCE OUTLET SERVICE FITTING

- A. Housing: Satin aluminum.
- B. Device Plate: Stainless steel.
- C. Configuration: One duplex or two duplex, back-to-back as required.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Verify locations of floor boxes and outlets in all rooms with Architect prior to rough-in.

3.02 INSTALLATION

- A. Boxes and fittings are indicated on Drawings in approximate locations unless dimensioned. Scale drawings to determine locations. Adjust box location up to 12 inches to accommodate intended purpose. Verify all adjustments with Architect before placing floor boxes.
- B. Floor Box Requirements: Use cast floor boxes for installations in slab on grade.
- C. Set floor boxes level.
- D. Install boxes and fittings to preserve fire resistance rating of slabs and other elements, using materials and methods specified in Section 26 05 29.
- E. Install protective rings on active flush cover service fittings.

3.03 ADJUSTING

- A. Adjust floor box flush with finish flooring material.
- B. Install flooring material in all floor box recessed covers.

3.04 CLEANING

- A. Clean interior of boxes to remove dust, debris, and other material.

END OF SECTION

SECTION 26 05 53

ELECTRICAL IDENTIFICATION

PART 1 GENERAL

1.01 WORK INCLUDED

- A. Nameplates.
- B. Wire and cable markers.
- C. Conduit color coding.

1.02 SUBMITTALS

- A. Submit shop drawings under provisions of Section 26 03 05. Include schedule for nameplates and tape labels.

PART 2 PRODUCTS

2.01 MATERIALS

- A. Nameplates: Engraved three-layer laminated plastic, White letters on a Black background, unless otherwise noted on the drawings.
- B. Wire and Cable Markers: Cloth markers, split sleeve or tubing type.

PART 3 EXECUTION

3.01 INSTALLATION

- A. Degrease and clean surfaces to receive nameplates.
- B. Install nameplates parallel to equipment lines.
- C. Secure nameplates to equipment fronts using screws, rivets, or adhesive. Secure nameplate to inside face of recessed panelboard doors in finished locations.
- D. Embossed tape will not be permitted for any application.

3.02 WIRE IDENTIFICATION

- A. Provide wire markers on each feeder conductor in panelboard gutters, pull boxes, and at load connection. Identify with feeder number for power and lighting circuits.

3.03 NAMEPLATE ENGRAVING SCHEDULE

- A. Provide nameplates of minimum letter height as scheduled below.
- B. Panelboards and Switchboards: 1/4 inch; identify equipment designation. 1/8 inch; identify voltage rating and source.
- C. Individual Circuit Breakers, Enclosed Switches, and Motor Starters: 1/8 inch; identify load served.

END OF SECTION

SECTION 26 24 13

SWITCHBOARDS

PART 1 - GENERAL

1.01 SUMMARY

- A. Section includes main and distribution switchboards.
- B. Related Sections:
 - 1. Section 26 05 26 - Grounding and Bonding.
 - 2. Section 26 05 53 - Electrical Identification.
 - 3. Section 33 71 73 - Electrical Utility Services: Utility metering equipment.

1.02 REFERENCES

- A. American National Standards Institute:
 - 1. ANSI C12.1 - Code for Electricity Metering.
 - 2. ANSI C39.1 - Requirements, Electrical Analog Indicating Instruments.
- B. Institute of Electrical and Electronics Engineers:
 - 1. IEEE C57.13 - Standard Requirements for Instrument Transformers.
 - 2. IEEE C62.41 - Recommended Practice on Surge Voltages in Low-Voltage AC Power Circuits.
- C. National Electrical Manufacturers Association:
 - 1. NEMA AB 1 - Molded Case Circuit Breakers and Molded Case Switches.
 - 2. NEMA FU 1 - Low Voltage Cartridge Fuses.
 - 3. NEMA KS 1 - Enclosed and Miscellaneous Distribution Equipment Switches (600 Volts Maximum).
 - 4. NEMA PB 2 - Deadfront Distribution Switchboards.
 - 5. NEMA PB 2.1 - General Instructions for Proper Handling, Installation, Operation, and Maintenance of Deadfront Distribution Switchboards Rated 600 Volts or Less.
- D. International Electrical Testing Association:
 - 1. NETA ATS - Acceptance Testing Specifications for Electrical Power Distribution Equipment and Systems.

1.03 SUBMITTALS

- A. Section 26 03 05 - Submittal Procedures: Submittal procedures..
- B. Shop Drawings: Indicate front and side views of enclosures with overall dimensions shown; conduit entrance locations and requirements; nameplate legends; size and number of bus bars for each phase, neutral, and ground; and switchboard instrument details.
- C. Product Data: Submit electrical characteristics including voltage, frame size and trip ratings, fault current withstand ratings, and time-current curves of equipment and components.
- D. Test Reports: Indicate results of factory production and field tests.

1.04 CLOSEOUT SUBMITTALS

- A. Section 01 70 00 - Execution Requirements: Closeout procedures.
- B. Project Record Documents: Record actual locations, configurations, and ratings of switchboards and their components on single line diagrams and plan layouts.
- C. Operation and Maintenance Data: Submit spare parts data listing; source and current prices

of replacement parts and supplies; and recommended maintenance procedures and intervals.

1.05 QUALIFICATIONS

- A. Manufacturer: Company specializing in manufacturing products specified in this section with minimum three years documented experience.

1.06 DELIVERY, STORAGE, AND HANDLING

- A. Deliver in 48 inch maximum width shipping splits, individually wrapped for protection and mounted on shipping skids.
- B. Accept switchboards on site. Inspect for damage.
- C. Store in clean, dry space. Maintain factory wrapping or provide additional canvas or plastic cover to protect units from dirt, water, construction debris, and traffic.
- D. Handle in accordance with NEMA PB 2.1. Lift only with lugs provided. Handle carefully to avoid damage to switchboard internal components, enclosure, and finish.

1.07 ENVIRONMENTAL REQUIREMENTS

- A. Section 01 60 00 - Product Requirements.
- B. Conform to NEMA PB 2 service conditions during and after installation of switchboards.

1.08 FIELD MEASUREMENTS

- A. Verify field measurements prior to fabrication.

1.09 SEQUENCING

- A. Section 01 10 00 - Summary: Work sequence.
- B. Sequence Work to avoid interferences with building finishes and installation of other products.

1.10 MAINTENANCE MATERIALS

- A. Section 01 70 00 - Execution Requirements: Spare parts and maintenance products.
- B. Furnish two of each key.

PART 2 - PRODUCTS

2.01 SERVICE DISTRIBUTION SWITCHBOARDS

- A. Product Description: NEMA PB 2, enclosed switchboard with electrical ratings and configurations as indicated on Drawings. Service entrance rated.
- B. Ratings:
 1. Voltage: 120/208 volts.
 2. Configuration: Three phase, four wire, grounded.
 3. Main Bus: 1000 amperes for main switchboard.
 4. Integrated Equipment Rating: 65,000 rms amperes symmetrical. Brand and feeder devices may be series rated with main device.

- C. Device Mounting:
 - 1. Main Section: Individually mounted.
 - 2. Distribution Section: Panel mounted.
- D. Bus:
 - 1. Material: Copper with tin plating, standard size.
 - 2. Connections: Bolted, accessible from front for maintenance.
 - 3. Insulation: Fully insulate bus bars. Do not reduce spacing of insulated bus.
- E. Ground Bus: Extend length of switchboard.
- F. Line and Load Terminations: Accessible from front only of switchboard, suitable for conductor materials and sizes as indicated on Drawings.
- G. Future Provisions: Fully equip spaces for future devices with bussing and bus connections, insulated and braced for short circuit currents. Furnish continuous current rating.
- H. Enclosure: NEMA Type 12.
- I. Align sections at front and rear.
- J. Switchboard Height: 90 inches, excluding floor sills, lifting members and pull boxes.
- K. Finish: Manufacturer's standard light gray enamel over external surfaces. Coat internal surfaces with minimum one coat corrosion-resisting paint, or plate with cadmium or zinc.

2.02 MOLDED CASE CIRCUIT BREAKER

- A. Product Description: NEMA AB 1, molded-case circuit breaker.
- B. Field-Adjustable Trip Circuit Breaker: Circuit breakers with frame sizes 200 amperes and larger shall have mechanism for adjusting long time, short time, continuous current, short time, long time, pickup current setting for automatic operation.
- C. Solid-State Circuit Breaker: Electronic sensing, timing, and tripping circuits for adjustable current settings; instantaneous trip; and adjustable short time trip.
- D. Accessories: As indicated on Drawings. Conform to NEMA AB 1.
 - 1. Shunt Trip Device: 120 volts, AC.
 - 2. Handle Lock: Provisions for padlocking.
 - 3. Grounding Lug: In each enclosure.

2.03 INSULATED CASE CIRCUIT BREAKER

- A. Product Description: NEMA AB 1, enclosed, insulated-case circuit breaker.
- B. Trip Unit: Electronic sensing, timing, and tripping circuits for adjustable current settings; instantaneous trip; and adjustable short time trip.
- C. Accessories: As indicated on Drawings. Conform to NEMA AB 1.
 - 1. Shunt Trip Device: 120 volts, AC.
 - 2. Handle Lock: Provisions for padlocking.
 - 3. Grounding Lug: In each enclosure.

2.04 GROUND FAULT DEVICES

- A. Ground Fault Sensor: Zero sequence type.
- B. Ground Fault Relay: Adjustable ground fault sensitivity from 200 to 1200 amperes, time delay adjustable from 0 to 15 seconds. Furnish monitor panel with lamp to indicate relay operation,

TEST and RESET control switches.

2.05 AMMETERS AND VOLTMETERS

- A. Provide electronic microprocessor-based equipment capable of displaying amps and volts for all phases, peak demand, present demand and energy consumption unit shall be Westinghouse IQ Data Plus II or approved equal.

2.06 METERING TRANSFORMERS

- A. Current Transformers: IEEE C57.13; 5 ampere secondary, bar or window type, with single secondary winding and secondary shorting device, primary/secondary ratio as recommended by manufacturer, burden and accuracy consistent with connected metering and relay devices, 60 Hertz.
- B. Potential Transformers: IEEE C57.13; 120 volt single secondary, disconnecting type with integral fuse mountings, primary/secondary ratio as recommended by manufacturer, burden and accuracy consistent with connected metering and relay devices, 60 Hertz.

PART 3 - EXECUTION

3.01 EXAMINATION

- A. Section 01 30 00 - Administrative Requirements: Coordination and project conditions.
- B. Verify surface is suitable for switchboard installation.

3.02 INSTALLATION

- A. Install in accordance with NEMA PB 2.1.
- B. Tighten accessible bus connections and mechanical fasteners after placing switchboard.
- C. Install fuses in each switch and coordinate sizes with connected load.
- D. Install engraved plastic nameplates in accordance with Section 26 05 53.
- E. Install breaker circuit directory.
- F. Ground and bond switchboards in accordance with Section 26 05 26.

3.03 FIELD QUALITY CONTROL

- A. Inspect and test in accordance with NETA ATS, except Section 4.
- B. Perform inspections and tests listed in NETA ATS, Section 7.1.

3.04 ADJUSTING

- A. Section 01 70 00 - Execution Requirements: Testing, adjusting, and balancing.
- B. Adjust operating mechanisms for free mechanical movement.
- C. Tighten bolted bus connections.
- D. Adjust circuit breaker trip and time delay settings to values as indicated on Drawings.

3.05 CLEANING

- A. Section 01 70 00 - Execution Requirements: Final cleaning.
- B. Touch up scratched or marred surfaces to match original finish.

END OF SECTION

SECTION 26 24 16

PANELBOARDS

PART 1 GENERAL

1.01 WORK INCLUDED

- A. Distribution panelboards.
- B. Lighting and appliance branch circuit panelboards.

1.02 REFERENCES

- A. NEMA AB 1 - Molded Case Circuit Breakers.
- B. NEMA PB 1 - Panelboards.
- C. NEMA PB 1.1 - Instructions for Safe Installation, Operation and Maintenance of Panelboards Rated 600 Volts or Less.
- D. NEMA PB 1.2 - Application Guide for Ground-fault Protective Devices for Equipment.

1.03 SUBMITTALS

- A. Submit shop drawings and product data for equipment and component devices under provisions of Section 26 03 05.
- B. Include outline and support point dimensions, voltage, main bus ampacity, integrated short circuit ampere rating, circuit breaker and fusible switch arrangement and sizes.

1.04 SPARE PARTS

- A. Keys: Furnish 2 each to Owner, for each cabinet lock installed.

PART 2 PRODUCTS

2.01 MAIN DISTRIBUTION PANELBOARDS AND PANELBOARDS FOR AIR CONDITIONING EQUIPMENT:

- A. Panelboards: NEMA PB 1; circuit breaker type.
- B. Enclosure: NEMA PB 1; Type 1. Cabinet size: 6 inches deep; 20 inches wide and NEMA type 3R for outdoor installation.
- C. Provide cabinet front with hinged interior cover and hinged door with flush lock. Finish in manufacturer's standard gray enamel.
- D. Provide panelboards with copper bus, ratings as scheduled on Drawings. Provide copper ground bus in all panel boards.
- E. Minimum Integrated Short Circuit Rating: 65,000 amperes rms symmetrical for 208 volt. Select panelboards rated to meet maximum rms amperes symmetrical as required by the utility company service requirements.
- F. Molded Case Circuit Breakers: NEMA AB 1 provide circuit breakers with integral thermal and instantaneous magnetic trip in each pole. Provide circuit breakers UL listed as Type HACR for air conditioning equipment branch circuits.

2.02 BRANCH CIRCUIT PANELBOARDS

- A. Lighting and Branch Circuit Panelboards: NEMA PB1; circuit breaker type.
- B. Enclosure: NEMA PB 1; Type 1 indoor, NEMA 3R outdoor.
- C. Cabinet Size: 6 inches deep; 20 inches wide.
- D. Provide flush or surface as cabinet front as indicated with hinged interior cover concealed trim clamps, concealed hinge and flush lock all keyed alike. Finish in manufacturer's standard gray enamel.
- E. Provide panelboards with copper bus, ratings as scheduled on Drawings. Provide copper ground bus in all panelboards.
- F. Minimum Integrated Short Circuit Rating: 22,000 amperes rms symmetrical for 208 volt panelboards.
- G. Molded Case Circuit Breakers: NEMA AB 1; bolt-on type thermal magnetic trip circuit breakers, with common trip handle for all poles. Provide circuit breakers UL listed as Type SWD for lighting circuits. Provide UL Class A ground fault interrupter circuit breakers for circuits indicated on Drawings.

PART 3 EXECUTION**3.01 INSTALLATION**

- A. Install panelboards plumb and flush with wall finishes, in conformance with NEMA PB 1.1.
- B. Height: 6 ft.
- C. Provide filler plates for unused spaces in panelboards.
- D. Provide typed circuit directory for each branch circuit panelboard. Revise directory to reflect circuiting changes required to balance phase loads.
- E. Stub 5 empty one inch conduits to accessible location above ceiling out of each recessed panelboard.

3.02 FIELD QUALITY CONTROL

- A. Measure steady state load currents at each panelboard feeder. Should the difference at any panelboard between phases exceed 20 percent, rearrange circuits in the panelboard to balance the phase loads within 20 percent. Take care to maintain proper phasing for multi-wire branch circuits.
- B. Visual and Mechanical Inspection: Inspect for physical damage, proper alignment, anchorage, and grounding. Check proper installation and tightness of connections for circuit breakers, fusible switches, and fuses.

3.03 PANELBOARD SCHEDULE

- A. Panelboards shall be as scheduled on the Drawings.

3.04 SURGE SUPPRESSION

- A. Provide transient voltage surge suppression protection according to Section 26 35 55, "Transient Voltage Surge Suppression" on all new panelboards.

END OF SECTION

SECTION 26 24 18

MOTOR CONTROL

PART 1 GENERAL

1.01 WORK INCLUDED

- A. Manual motor starters.
- B. Magnetic motor starters.
- C. Combination magnetic motor starters.

1.02 REFERENCES

- A. ANSI/NEMA ICS 6 - Enclosures for Industrial Controls and Systems.
- B. FS W-C-375 - Circuit Breakers, Molded Case; Branch Circuit and Service.
- C. FS W-P-115 - Power Distribution Panel.
- D. FS W-S-865 - Switch, Box, (Enclosed), Surface-Mounted.
- E. NEMA AB 1 - Molded Case Circuit Breakers.
- F. NEMA ICS 2 - Industrial Control Devices, Controllers, and Assemblies.
- G. NEMA KS 1 - Enclosed Switches.
- H. NEMA PB 1 - Panelboards.
- I. NEMA PB 1.1 - Instructions for Safe Installation, Operation and Maintenance of Panelboards Rated 600 Volts or Less.

1.03 SUBMITTALS

- A. Submit shop drawings and product data under provisions of Section 26 03 05.
- B. Provide product data on motor starters and combination motor starters, relays, pilot devices, and switching and overcurrent protective devices.
- C. Submit manufacturers' instructions under provisions of Section 26 03 05-1.09.

1.04 OPERATION AND MAINTENANCE DATA

- A. Submit operation and maintenance data under provisions of Section 26 03 05-1.05.
- B. Include spare parts data listing; source and current prices of replacement parts and supplies; and recommended maintenance procedures and intervals.

1.05 DELIVERY, STORAGE, AND HANDLING

- A. Deliver products to site under provisions of Section 26 03 05-1.07.
- B. Store and protect products under provisions of Section 26 03 05-1.07.

1.06 SPARE PARTS

- A. Keys: Furnish 2 each to Owner, for each cabinet lock installed.

PART 2 PRODUCTS**2.01 MANUAL MOTOR STARTERS**

- A. Manual Motor Starter: NEMA ICS 2; size M-0 3 pole, AC general-purpose Class A manually operated non-reversing full-voltage controller for induction motors rated in horsepower, with overload relay, NO auxiliary contact, and push button operator.
- B. Fractional Horsepower Manual Starter: NEMA ICS 2; AC general-purpose Class A manually operated, 2 pole, full-voltage controller for fractional horsepower induction motors, with thermal overload unit, and toggle operator.
- C. Motor Starting Switch: NEMA ICS 2; AC general-purpose Class A manually operated 2 pole, full-voltage controller for fractional horsepower induction motors, with thermal overload unit, toggle operator.
- D. Enclosure: ANSI/NEMA ICS 6; Type 1, unless indicated otherwise.

2.02 MAGNETIC MOTOR STARTERS

- A. Magnetic Motor Starters: NEMA ICS 2; AC general-purpose Class A magnetic controller for induction motors rated in horsepower.
- B. Full Voltage Starting: Non-reversing type.
- C. Coil Operating Voltage: 120 volts, 60 Hertz.
- D. Size: NEMA ICS 2; size as shown on Drawings.
- E. Overload Relay: NEMA ICS 2; melting alloy.
- F. Enclosure: NEMA ICS 6; Type 1. Unless indicated otherwise.
- G. Combination Motor Starters: Combine motor starters with motor circuit protector disconnect in common enclosure.
- H. Auxiliary Contacts: NEMA ICS 2; two and field convertible contacts in addition to seal-in contact.
- I. Pushbuttons: NEMA ICS 2; START/STOP in front cover.
- J. Indicating Lights: NEMA ICS 2; RUN: green in front cover.
- K. Selector Switches: NEMA ICS 2; HAND/OFF/AUTO in front cover.
- L. Control Power Transformers: 120 volt secondary, capacity as required for control equipment.
- M. Transient Voltage Surge Suppressor: Manufacturer's standard coil transient suppressor, factory installed.

2.03 CONTROLLER OVERCURRENT PROTECTION AND DISCONNECTING MEANS

- A. Motor Circuit Protector: NEMA AB 1; circuit breakers with integral instantaneous magnetic trip in each pole.

- B. Provide manufacturer's standard transient voltage surge suppressor, factory installed.

PART 3 EXECUTION

3.01 INSTALLATION

- A. Install motor control equipment in accordance with manufacturer's instructions.
- B. Select and install heater elements in motor starters to match installed motor characteristics.
- C. Motor Data: Provide neatly typed label inside each motor starter enclosure door identifying motor served, nameplate horsepower, full load amperes, code letter, service factor, and voltage/phase rating.

END OF SECTION

SECTION 26 27 16

CABINETS AND ENCLOSURES

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Hinged cover enclosures.
- B. Cabinets.
- C. Terminal blocks.
- D. Accessories.

1.02 RELATED SECTIONS

- A. Section 26 05 29 - Supporting Devices.

1.03 REFERENCES

- A. NEMA 250 - Enclosures for Electrical Equipment (1000 Volts Maximum).
- B. NEMA ICS 4 - Terminal Blocks for Industrial Control Equipment and Systems.
- C. ANSI/NFPA 70 - National Electrical Code.

1.04 SUBMITTALS

- A. Submit under provisions of Section 26 03 05.
- B. Product Data: Provide manufacturer's standard data for enclosures and cabinets.
- C. Manufacturer's Instructions: Indicate application conditions and limitations of use stipulated by Product testing agency specified under Regulatory Requirements. Include instructions for storage, handling, protection, examination, preparation, installation, and starting of Product.

1.05 REGULATORY REQUIREMENTS

- A. Conform to requirements of ANSI/NFPA 70.
- B. Furnish products listed and classified by Underwriters Laboratories, Inc. as suitable for purpose specified and shown.

1.06 EXTRA MATERIALS

- A. Provide two of each cabinet key.

PART 2 PRODUCTS

2.01 HINGED COVER ENCLOSURES

- A. Construction: NEMA 250, Type 12 steel enclosure.
- B. Covers: Continuous hinge, held closed by flush latch operable by key.
- C. Provide interior metal panel for mounting terminal blocks and electrical components; finish with white enamel.

- D. Enclosure Finish: White enamel. Stainless steel in manufacturing areas and laboratories.

2.02 CABINETS

- A. Boxes: Galvanized steel.
- B. Backboard: Provide interior metal panel for mounting terminals blocks and electrical components; finish with white enamel.
- C. Fronts: Steel, flush type with concealed trim clamps, concealed hinge, and flush lock keyed to match branch circuit panelboard. Finish with gray baked enamel.
- D. Provide metal barriers to separate compartments containing control wiring operating at less than 50 volts from power wiring.
- E. Provide accessory feet for free-standing equipment.

2.03 TERMINAL BLOCKS

- A. Terminal Blocks: ANSI/NEMA ICS 4.
- B. Power Terminals: Unit construction type with closed back and tubular pressure screw connectors, rated 600 volts.
- C. Signal and Control Terminals: Modular construction type, suitable for channel mounting, with tubular pressure screw connectors, rated 300 volts.
- D. Provide ground bus terminal block, with each connector bonded to enclosure.

PART 3 EXECUTION

3.01 INSTALLATION

- A. Install Products in accordance with manufacturer's instructions.
- B. Install enclosures and boxes plumb. Anchor securely to wall and structural supports at each corner.
- C. Install cabinet fronts plumb.

END OF SECTION

SECTION 26 27 26

WIRING DEVICES

PART 1 GENERAL

1.01 WORK INCLUDED

- A. Wall switches.
- B. Receptacles.
- C. Floor mounted service fittings.
- D. Device plates and box covers.

1.02 REFERENCES

- A. NEMA WD 1 - General-Purpose Wiring Devices.
- B. NEMA WD 5 - Specific-Purpose Wiring Devices.

1.03 SUBMITTALS

- A. Submit product data under provisions of Section 26 03 05.
- B. Provide product data showing configurations, finishes, dimensions, and manufacturer's instructions.

PART 2 PRODUCTS

2.01 WALL SWITCHES

- A. Wall Switches for Lighting Circuits: NEMA WD 1. AC general use snap switch with toggle handle, rated 20 amperes at 120/277 volts AC. Handle: Ivory plastic.
- B. Pilot Light Type: Pilot strap in adjacent gang.

2.02 RECEPTACLES

- A. Convenience and Straight-blade Receptacles: NEMA WD 1.
- B. Locking-Blade Receptacles: NEMA WD 5.
- C. Convenience Receptacle Configuration: NEMA WD 1; Type 5- 20 R.
- D. Specific-use Receptacle Configuration: NEMA WD 1 or WD 5; type as indicated on Drawings.
- E. GFCI Receptacles: Duplex convenience receptacle with integral ground fault current interrupter.

2.03 WALL PLATES

- A. Decorative Cover Plate: Stainless Steel. (Smooth, jumbo).
- B. Device Plates for Surface Mounted Outlets: Galvanized surface outlet covers to fit 4 inch square boxes.
- C. Weatherproof Cover Plate: Gasketed cast metal with hinged gasketed device covers.

PART 3 EXECUTION**3.01 INSTALLATION**

- A. Install wall switches 48 inches above floor, OFF position down.
- B. Install convenience receptacles 18 inches above floor, 6 inches above counters or backsplash if present, grounding pole on bottom.
- C. Install specific-use receptacles at heights shown on Contract Drawings.
- D. Corridor Convenience Receptacles: Hospital Grade.
- E. Install smooth stainless steel plates on switch, receptacle, and blank outlets in finished areas, using jumbo size plates for outlets installed in all walls.
- F. Install galvanized steel plates on outlet boxes and junction boxes in unfinished areas, above accessible ceilings, and on surface-mounted outlets.
- G. Install devices and wall plates flush and level.

END OF SECTION

SECTION 26 28 19

DISCONNECT SWITCHES

PART 1 GENERAL

1.01 WORK INCLUDED

- A. Disconnect switches.
- B. Enclosures.

1.02 REFERENCES

- A. NEMA KS 1 - Enclosed Switches.

1.03 SUBMITTALS

- A. Submit product data under provisions of Section 26 03 05.

PART 2 PRODUCTS

2.01 DISCONNECT SWITCHES

- A. Fused or Nonfusible Switch Assemblies: NEMA KS 1; Type HD; quick-make, quick-break, load interrupter enclosed knife switch with externally operable handle interlocked to prevent opening front cover with switch in ON position. Handle lockable in OFF position.
- B. Enclosures: NEMA KS 1; Type as indicated on Drawings.
- C. Fuse Rating/Size: As shown on Drawings.

PART 3 EXECUTION

3.01 INSTALLATION

- A. Install disconnect switches where indicated on Drawings or as required in Division 23.

END OF SECTION

SECTION 26 35 55

TRANSIENT VOLTAGE SURGE SUPPRESSION

PART 1 GENERAL

1.01 DESCRIPTION

- A. This section describes the materials and installation requirements for transient voltage surge suppressors (TVSS) for the protection of all AC electrical circuits from the effects of lightning induced currents, substation switching transients and internally generated transients resulting from inductive and/or capacitive load switching.
- B. This section includes materials and installation of Transient Voltage Surge Suppressors (TVSS) for the protection of electronic circuits and equipment.

1.02 RELATED WORK

- A. Section 26 03 05, "General Electrical Requirements"
- B. Section 26 05 32, "Conduit"
- C. Section 26 05 19, "Wire and Cable"
- D. Section 26 05 33, "Boxes"
- E. Section 26 05 26, "Secondary Grounding"
- F. Section 26 24 18, "Motor control"

1.03 REFERENCES

- A. UL 1449 Second Edition, 2005 Revision (effective 2/9/2007).
- B. UL 1283.
- C. ANSI/IEEE C62.41, Recommended Practice for Surge Voltages in Low-Voltage AC Power Circuits.
- D. ANSI/IEEE C62.45, Guide for Surge Testing for equipment connected to Low-Voltage AC Power Circuits.
- E. IEEE 1100 Emerald Book.
- F. NEMA LS-1, 1992-(R2000) Low-Voltage Surge Protection Devices.
- G. National Fire Protection Association (NFPA 70: National Electrical Code).

1.04 SUBMITTALS

- A. Submit product data under provisions of Section 26 03 05. Include shop drawings, product data and manufacturer's installation instructions.
- B. The surge suppression submittals shall also include:
 - 1. Copies of Manufacturer's catalog data, technical information and specifications on equipment proposed for use.
 - 2. Copies of documentation stating that the Surge Protection Device is listed from a Nationally Recognized Testing Laboratory (NRTL) (UL, ETL, etc.) and are tested and multi-listed to UL 1449 and UL 1283.

3. Copies of actual let through voltage data in the form of oscillograph results for both ANSI/IEEE C62.41 Category 3 (combination wave) and B3 (Ring wave) tested in accordance with ANSI/IEEE C62.45.
4. Copies of Noise Rejection testing as outlined in NEMA LS1-1993 (R2000) Section 3.11. Noise rejection is to be measured between 50kHz and 100MHz verifying the devices noise attenuation. Must show multiple attenuation levels over a range of frequencies.
5. Copies of Surge Fuse Testing. Each unit shall be surge tested with fusing in series to verify that a transient of maximum surge current capacity/magnitude is fully suppressed without fuse failure, operation or degradation per NEMA LS1-1992 (R2000) Section 3.9.
6. Copies of test reports from a recognized independent testing laboratory, capable of producing 200kA surge current waveforms, verifying the suppressor components can survive published surge current rating on both a per mode and per phase basis using the ANSI/IEEE C62.41 impulse waveform C3 (8 x 20 microsecond, 20kV/10kA). Test data on an individual module is not acceptable.
7. Copy of warranty statement clearly establishing the terms and conditions to the building/facility owner/operator.

1.05 WARRANTY

- A. All TVSS units shall be guaranteed to be free of defects in materials and workmanship for a period of five years from the date of installation.
- B. Any suppressor which fails or operates improperly, even as a result of a direct lightning strike, will be replaced by the manufacturer at no expense to the owner.

1.06 QUALITY ASSURANCE

- A. All suppressors shall be manufactured in the United States by a company normally engaged in the design, development, and manufacture of such devices for electrical and electronics systems equipment for a minimum period of five years.
- B. All manufacturers will provide products which do not interrupt power to the protected system in the event of a suppressor failure, for life safety applications, i.e., fire alarm. Written certification of this parameter shall be provided by the suppressor manufacturer.
- C. The suppressors listed in this specification shall not impair the performance of the protected systems, including, but not limited to, the following parameters: degradation of signal quality or levels, attenuation, and distortion. The suppressors shall not initiate conditions which jeopardize the life safety features of fire alarms, communications, energy management, and other code related protection.

PART 2 PRODUCTS

2.01 SERVICE ENTRANCE AND MAIN DISTRIBUTION PANEL SUPPRESSORS

- A. Suppressors shall be listed in accordance with UL 1449, "Standard for Safety, Transient Voltage Surge Suppressors", and UL 1283, "Electromagnetic Interference Filters".
- B. Suppressors shall be independently tested with the category C3 high exposure waveform (20 kV, 10kA, 8/20 micro-second waveform) clamp voltage test results.
- C. Suppressors shall incorporate copper bus bars for the surge current path. Small round wiring or plug-in connections shall not be used in the path for surge current diversion. Surge current diversion modules shall use bolted connections to the bus bars for reliable low impedance connections.
- D. The unit shall include an engineered solid-state high performance suppression filter system, utilizing metal oxide varistors, and polypropylene capacitors. Units may contain selenium cells to achieve higher ratings.

- E. The unit shall contain 200,000 AIC fuses on each phase.
- F. The status of each phase shall be monitored on the front of the suppressor's enclosure.
- G. For three phase, four wire plus ground configurations, the unit shall provide protection in all modes, Line to Neutral, Line to Ground, Line to Line and Neutral to Ground.
- H. Suppressors shall be equipped with an audible alarm which shall activate upon device failure. An alarm on/off switch shall be provided to silence the alarm and an alarm push-to-test switch shall be provided to test the alarm. The switches and alarm shall be located on the front cover of the suppressor's enclosure.

I. Suppressor shall meet or exceed the following criteria:

1. Tested maximum single impulse surge current rating per mode shall be:

Line to Line	100,000A
Line to Neutral	100,000A
Line to Ground	100,000A
Neutral to Ground	100,000A

2. Pulse life test: Capable of protecting against and surviving 3500 ANSI/IEEE C62.41 Category C3(20kV, 10 kA) transients without failure or degradation of UL 1449 suppression rating by more than 10%.

3. The UL 1449 suppression rating shall be listed with an integral disconnect switch, where applicable, and shall not exceed the following:

For units with an integral disconnect switch:

VOLTAGE	L-N	L-G	N-G	L-L
120/208	400V	500V	500V	700V
277/480	800V	1000V	900V	1500V

J. The suppressor shall have a response time no greater than five nanoseconds for any of the individual protection modes.

K. The unit shall include a high-frequency extended range tracking filter and shall be UL 1283 listed as an electromagnetic interference filter. The filter shall reduce fast rise-time, high frequency, error producing transients. The filter shall provide minimum noise attenuation as follows:

	Attenuation Frequency			
	100KHz	1 MHz	10MHz	100MHz
Attenuation dB	41	31	35	53

L. Suppressors shall be designed to withstand a maximum continuous operating voltage (MCOV) of not less than 125% of nominal RMS voltage for 120 volt systems.

M. The unit shall incorporate solid state, long life, externally mounted LED visual status indicators that indicate the on line status of each phase of the unit.

N. The unit shall incorporate an integral test point allowing easy off line diagnostic testing which verifies the operational integrity of the unit's suppression filter system.

O. The unit shall include mechanical lugs for each phase, neutral and ground. The lugs shall accommodate up to #4 AWG copper conductor with integral fused disconnect switch, and up to 1/0 AWG copper conductor without an integral fused disconnect switch.

P. Suppressor manufacturer shall provide certified test data confirming a "fail-short" failure mode.

- Q. Suppressors shall be equipped with the following optional items:
1. Integral Disconnect. The unit shall include an integral disconnect switch located in the unit enclosure with an externally mounted manual operator. The switch shall disconnect all ungrounded circuit conductors from the distribution system to enable testing and maintenance without interruption of power to the facility. The switch shall be rated 600 volt AC. The unit shall be UL 1449 listed with the integral disconnect switch and the UL 1449 suppression rating for this configuration shall be provided.
 2. Disturbance Counter. A transient voltage surge counter shall be located on the front cover of the suppressor. The counter shall be equipped with a manual reset and a battery to retain memory upon loss of AC power.

R. Acceptable manufacturers:

Current Technology
Eaton Innovative Technology
Square D Surge Logic

2.02 208 VOLT AND 480 VOLT SUB PANEL SUPPRESSORS

- A. Suppressors shall be listed in accordance with UL 1449, "Standard for Safety, Transient Voltage Surge Suppressors", and UL 1283, "Electromagnetic Interference Filters".
- B. Suppressors shall be independently tested with the category C3 high exposure waveform (20 kV, 10kA, 8/20 micro-second waveform) clamp voltage test results.
- C. Suppressors shall incorporate copper bus bars for the surge current path. Small round wiring or plug-in connections shall not be used in the path for surge current diversion. Surge current diversion modules shall use bolted connections to the bus bars for reliable low impedance connections.
- D. The unit shall include an engineered solid-state high performance suppression filter system, utilizing metal oxide varistors, and polypropylene capacitors.
- E. The unit shall contain 200,000 AIC fuses on each phase.
- F. The status of each phase shall be monitored on the front of the suppressor's enclosure.
- G. For three phase, four wire plus ground configurations, the unit shall provide protection in all modes, Line to Neutral, Line to Ground, and Neutral to Ground.
- H. Suppressors shall be equipped with an audible alarm which shall activate upon device failure. An alarm on/off switch shall be provided to silence the alarm and an alarm push-to-test switch shall be provided to test the alarm. The switches and alarm shall be located on the front cover of the suppressor's enclosure.
- I. Suppressor shall meet or exceed the following criteria:
 1. Tested maximum single impulse surge current rating per mode shall be:

Line to Line	80,000A
Line to Neutral	80,000A
Line to Ground	80,000A
Neutral to Ground	80,000A
 2. Pulse life test: Capable of protecting against and surviving 2500 ANSI/IEEE C62.41 Category C3(20kV, 10 kA) transients without failure or degradation of UL 1449 suppression rating by more than 10%.
 3. The UL 1449 suppression rating shall be listed with an integral disconnect switch, where applicable, and shall not exceed the following:

For units without an integral fused disconnect switch:

VOLTAGE	L-N	L-G	N-G	L-L
120/208	400V	500V	500V	700V
277/480	900V	1000V	800V	4800V

J. The suppressor shall have a response time no greater than five nanoseconds for any of the individual protection modes.

K. The unit shall include a high-frequency extended range tracking filter and shall be UL 1283 listed as an electromagnetic interference filter. The filter shall reduce fast rise-time, high frequency, error producing transients. The filter shall provide minimum noise attenuation as follows:

Attenuation dB	Attenuation Frequency			
	100KHz	1 MHz	10MHz	100MHz
	41	31	35	53

L. Suppressors shall be designed to withstand a maximum continuous operating voltage (MCOV) of not less than 125% of nominal RMS voltage for 120 volt systems.

M. The unit shall incorporate solid state, long life, externally mounted LED visual status indicators that indicate the on line status of each phase of the unit.

N. The unit shall incorporate an integral test point allowing easy off line diagnostic testing which verifies the operational integrity of the unit's suppression filter system.

O. The unit shall include mechanical lugs for each phase, neutral and ground. The lugs shall accommodate up to #4 AWG copper conductor with integral fused disconnect switch, and up to 1/0 AWG copper conductor without an integral fused disconnect switch.

P. Suppressor manufacturer shall provide certified test data confirming a "fail-short" failure mode.

Q. Acceptable manufacturers:

Current Technology
Eaton Innovative Technology
Square D Surge Logic

2.03 TERMINAL STRIP HARD-WIRED (120 VAC) SUPPRESSORS

A. Suppressors shall be listed in accordance with UL 1449, "Standard for Safety, Transient Voltage" "Surge Suppressors".

B. Suppressors shall consist of a three stage hybrid design: first stage - MOV, second stage - inductor, third stage - silicon avalanche diode or MOV.

C. Suppressors shall be internally fused in such a manner that power to protected equipment is not interrupted in the event of a suppressor failure.

D. Suppressors shall provide three suppression paths: line to neutral, line to ground, and neutral to ground.

E. Suppressors shall provide a maximum single impulse current rating of 25 kA (8/20 micro-second waveform) per mode.

F. Pulse life rating: Capable of protecting against and surviving 500 Category B3 transients (6 kV - 1.2/50 micro-second, 3 kA - 8/20 micro-second waveform).

G. Suppressors' maximum clamping voltage when subjected to Category B3 transients shall not

exceed 350 V peak.

- H. Visible indication of proper suppressor connection and operation shall be provided.
- I. The suppressor shall have a two year warranty.
- J. Acceptable manufacturers: Advanced Protection Technologies, Inc., Model TE/AC03UL, or approved equal.

2.04 INTERCOM CIRCUIT SUPPRESSORS

- A. Suppressors shall meet the following requirements:
 1. UL 497B listed and labeled.
 2. Utilize a multi-stage hybrid protection circuit.
 3. Consist of a plug-in replaceable modular design or individually mounted units.
 4. Designed for a fail-short mode of failure.
- B. Electrical Requirements
 1. Maximum single impulse current: 200 A (10/1000 micro-second waveform).
 2. Clamp voltage: not to exceed 150% of circuit peak operating voltage (100 A, 10/1000 micro-second waveform).
 3. Maximum continuous operating voltage: 125% of peak operating voltage, minimum.
 4. Capacitance for DC or low frequency lines shall not exceed 2000 pF (measured line to ground at the rated diode breakdown voltage).
 5. Pulse life: 200 impulses of 50 A (10/1000 micro-second waveform)
- C. Acceptable manufacturers: Advanced Protection Technologies, DA Series

2.05 SECURITY SYSTEMS

- A. Suppressors shall meet the following requirements:
 1. UL 497B listed and labeled.
 2. Utilize a multi-stage hybrid protection circuit.
 3. Consist of a plug-in replaceable modular design or individually mounted units.
 4. Designed for a fail-short mode of failure.
- B. Electrical Requirements
 1. Maximum single impulse current: 200 A (10/1000 micro-second waveform).
 2. Clamp voltage: not to exceed 150% of circuit peak operating voltage (100 A, 10/1000 micro-second waveform).
 3. Maximum continuous operating voltage: 125% of peak operating voltage, minimum.
 4. Capacitance for DC or low frequency lines shall not exceed 2000 pF (measured line to ground at the rated diode breakdown voltage).
 5. Pulse life: 200 impulses of 50 A (10/1000 micro-second waveform)
- C. Acceptable manufacturers: Advanced Protection Technologies, DA Series, or approved equal.

2.06 COAXIAL CABLE SUPPRESSORS

- A. Suppressors shall be installed on each generic or unspecified system coaxial cable on points of entry to or exit from separate buildings, and at roof mounted and other locations where direct exposure to lightning occurs. Suppressors shall meet the following criteria.
 1. Shunt clamping elements: gas tubes and high energy bipolar silicon avalanche diodes separated by a series resistance.
 2. Electrical Parameters:
 - a. Impedance: match the system being protected.
 - b. Capacitance: 10 pF.
 - c. Maximum single impulse current: 10 KA (8/20 micro-second waveform), minimum.
 - d. Clamping voltage: not to exceed 200% of normal peak operating voltage.
 3. Response time: less than one nanosecond.

For units without an integral fused disconnect switch:

VOLTAGE	L-N	L-G	N-G	L-L
120/208	400V	500V	500V	700V
277/480	900V	1000V	800V	4800V

- J. The suppressor shall have a response time no greater than five nanoseconds for any of the individual protection modes.
- K. The unit shall include a high-frequency extended range tracking filter and shall be UL 1283 listed as an electromagnetic interference filter. The filter shall reduce fast rise-time, high frequency, error producing transients. The filter shall provide minimum noise attenuation as follows:

	Attenuation Frequency			
	100KHz	1 MHz	10MHz	100MHz
Attenuation dB	41	31	35	53

- L. Suppressors shall be designed to withstand a maximum continuous operating voltage (MCOV) of not less than 125% of nominal RMS voltage for 120 volt systems.
- M. The unit shall incorporate solid state, long life, externally mounted LED visual status indicators that indicate the on line status of each phase of the unit.
- N. The unit shall incorporate an integral test point allowing easy off line diagnostic testing which verifies the operational integrity of the unit's suppression filter system.
- O. The unit shall include mechanical lugs for each phase, neutral and ground. The lugs shall accommodate up to #4 AWG copper conductor with integral fused disconnect switch, and up to 1/0 AWG copper conductor without an integral fused disconnect switch.
- P. Suppressor manufacturer shall provide certified test data confirming a "fail-short" failure mode.
- Q. Acceptable manufacturers:
- Current Technology
Eaton Innovative Technology
Square D Surge Logic

2.03 TERMINAL STRIP HARD-WIRED (120 VAC) SUPPRESSORS

- A. Suppressors shall be listed in accordance with UL 1449, "Standard for Safety, Transient Voltage" "Surge Suppressors".
- B. Suppressors shall consist of a three stage hybrid design: first stage - MOV, second stage - inductor, third stage - silicon avalanche diode or MOV.
- C. Suppressors shall be internally fused in such a manner that power to protected equipment is not interrupted in the event of a suppressor failure.
- D. Suppressors shall provide three suppression paths: line to neutral, line to ground, and neutral to ground.
- E. Suppressors shall provide a maximum single impulse current rating of 25 kA (8/20 micro-second waveform) per mode.
- F. Pulse life rating: Capable of protecting against and surviving 500 Category B3 transients (6 kV - 1.2/50 micro-second, 3 kA - 8/20 micro-second waveform).
- G. Suppressors' maximum clamping voltage when subjected to Category B3 transients shall not

exceed 350 V peak.

- H. Visible indication of proper suppressor connection and operation shall be provided.
- I. The suppressor shall have a two year warranty.
- J. Acceptable manufacturers: Advanced Protection Technologies, Inc., Model TE/AC03UL, or approved equal.

2.04 INTERCOM CIRCUIT SUPPRESSORS

- A. Suppressors shall meet the following requirements:
 1. UL 497B listed and labeled.
 2. Utilize a multi-stage hybrid protection circuit.
 3. Consist of a plug-in replaceable modular design or individually mounted units.
 4. Designed for a fail-short mode of failure.
- B. Electrical Requirements
 1. Maximum single impulse current: 200 A (10/1000 micro-second waveform).
 2. Clamp voltage: not to exceed 150% of circuit peak operating voltage (100 A, 10/1000 micro-second waveform).
 3. Maximum continuous operating voltage: 125% of peak operating voltage, minimum.
 4. Capacitance for DC or low frequency lines shall not exceed 2000 pF (measured line to ground at the rated diode breakdown voltage).
 5. Pulse life: 200 impulses of 50 A (10/1000 micro-second waveform)
- C. Acceptable manufacturers: Advanced Protection Technologies, DA Series

2.05 SECURITY SYSTEMS

- A. Suppressors shall meet the following requirements:
 1. UL 497B listed and labeled.
 2. Utilize a multi-stage hybrid protection circuit.
 3. Consist of a plug-in replaceable modular design or individually mounted units.
 4. Designed for a fail-short mode of failure.
- B. Electrical Requirements
 1. Maximum single impulse current: 200 A (10/1000 micro-second waveform).
 2. Clamp voltage: not to exceed 150% of circuit peak operating voltage (100 A, 10/1000 micro-second waveform).
 3. Maximum continuous operating voltage: 125% of peak operating voltage, minimum.
 4. Capacitance for DC or low frequency lines shall not exceed 2000 pF (measured line to ground at the rated diode breakdown voltage).
 5. Pulse life: 200 impulses of 50 A (10/1000 micro-second waveform)
- C. Acceptable manufacturers: Advanced Protection Technologies, DA Series, or approved equal.

2.06 COAXIAL CABLE SUPPRESSORS

- A. Suppressors shall be installed on each generic or unspecified system coaxial cable on points of entry to or exit from separate buildings, and at roof mounted and other locations where direct exposure to lightning occurs. Suppressors shall meet the following criteria.
 1. Shunt clamping elements: gas tubes and high energy bipolar silicon avalanche diodes separated by a series resistance.
 2. Electrical Parameters:
 - a. Impedance: match the system being protected.
 - b. Capacitance: 10 pF.
 - c. Maximum single impulse current: 10 KA (8/20 micro-second waveform), minimum.
 - d. Clamping voltage: not to exceed 200% of normal peak operating voltage.
 3. Response time: less than one nanosecond.

- B. Acceptable manufacturers: Advanced Protection Technologies; TE9025, or approved equal.

PART 3 EXECUTION

3.01 GENERAL

- A. Install TVSS equipment according to manufacturer's recommendations.
- B. Contractor shall properly match TVSS equipment to equipment being protected, including wire sizes, operating voltages and currents.
- C. Contractor shall coordinate with providers of all equipment being protected and provide TVSS equipment which meets these specifications.
- D. Provide required NEMA 1 (indoor) or NEMA 3R (outdoor) enclosures for suppressors adjacent to each electronic system cabinet, or coordinate with each electronic system supplier to provide oversized cabinets to incorporate suppressors into electronic systems cabinet.
- E. Electronic system equipment shall be protected by treating groups of related devices as a "cluster" and protecting all hard wire circuits which enter and leave the cluster. All equipment chassis within a protected cluster shall be bonded to a ground bar at the "window" location for the cluster, the window being the common point where all hard wire circuits enter or leave the cluster.

3.02 SERVICE ENTRANCE AND MAIN DISTRIBUTION PANELS AND MCC'S

- A. Install one primary suppressor at each utility service entrance to the facility, according to manufacturer's recommendations.
- B. Install one primary suppressor at each main distribution panel for each voltage in use at the facility, according to manufacturer's recommendations.
- C. Install one primary suppressor at each motor control center for each voltage in use at the facility, according to manufacturer's recommendations.
- D. The suppressor shall be installed on the load side of the service entrance.
- E. Conductors between suppressor and point of attachment shall be kept short and straight.
- F. Suppressor's ground shall be bonded to the service entrance ground.

3.03 208 VOLT AND 480 VOLT SUB PANELS

- A. Install one secondary suppressor at each sub panel location, according to manufacturer's recommendations.
- B. Conductors between suppressor and point of attachment shall be kept short and straight.
- C. Neutral and ground shall not be bonded together at secondary panelboard locations.
- D. Provide suitable three pole breaker in all panels as recommended by suppression manufacturer to connect unit.

3.04 ELECTRONIC EQUIPMENT (120 VAC) POWER SUPPLY

- A. Install one each hard-wired branch circuit suppressor between each of the following equipment items and its power supply conductors.
 - 1. Each Building Fire alarm control panel.
 - 2. Master Intercom panel.
 - 3. Each Building Energy Management and Control system panel.
- B. Install suppressor according to manufacturer's recommendations.

3.05 COAXIAL CABLE SYSTEMS

- A. Suppressors shall be installed on each cable TV coaxial cable system on points of entry to or exit from separate buildings, and at roof mounted equipment and other locations where direct exposure to lightning occurs.

3.06 GROUND INSTALLATION

- A. Ground Bus Connections
 - 1. Provide local ground bus in each terminal cabinet housing surge protection equipment (with other materials as required).
 - 2. Bond local ground bus to terminal cabinet with minimum #6 copper wire.
 - 3. Connect terminal cabinet local ground bus to systems ground bus with minimum #6 copper insulated wire (unless otherwise noted) in conduit.
 - 4. Note that the systems ground bar is also to be used for power transformation ground (480 V to 208 V) where applicable.
- B. Surge Suppression Equipment Grounding
 - 1. Connect each suppressor to local ground bus in terminal cabinet with wire sized as recommended by manufacturer. Where M block type terminations/suppressors are used, bond ground rail to local ground bar with wire as recommended by manufacturer.
 - 2. Ensure that 120 VAC power source/supply suppressor is also grounded to same local ground bus as suppressors provided in this section for same system (i.e., fire alarm, intercom, television, etc.).
- C. Grounding Conductors
 - 1. Conductors shall be a minimum size of #12 THWN (in conduit, insulated) unless otherwise noted or otherwise recommended by the manufacturer.
 - 2. Conductors shall be as short as possible.
 - 3. No bend radius shall be less than 6 inches or more than 90 degrees.
 - 4. Conductors shall be secured at 12 inch intervals with an approved copper clamp.
 - 5. Grounding conductors shall be properly connected to the building service ground by approved clamps.
 - 6. Do not bundle unprotected conductors with protected conductors.
- D. Grounding Connectors
 - 1. Connectors, splicers, and other fittings used to interconnect grounding conductors, or bond to equipment or grounding bars, shall be approved by UL or NEC for the purpose.
 - 2. All connectors and fittings shall be of the one time crimp or compression set-screw type solderless connection.
 - 3. Special treatment to fittings, lugs, or other connectors of dissimilar material shall be applied to prevent electrogalvanic action.

END OF SECTION

SECTION 26 51 00

LIGHTING FIXTURES

PART 1 GENERAL

1.01 WORK INCLUDED

- A. Interior luminaries and accessories.
- B. Exterior luminaries and accessories.
- C. Lamps.
- D. Ballasts.

1.02 REFERENCES

- A. ANSI C82.1 - Specification for Fluorescent Lamp Ballasts.
- B. ANSI C82.4 - Specifications for High-Intensity-Discharge Lamp Ballasts (Multiple Supply Type.)
- C. FS W-F-414 - Fixture, Lighting (Fluorescent, Alternating-Current, Pendant Mounting.)

1.03 SUBMITTALS

- A. Submit product data under provisions of Section 26 03 05.
- B. Include outline drawings, lamp and ballast data, support points, weights, and accessory information for each luminaire type.

1.04 DELIVERY, STORAGE, AND HANDLING

- A. Deliver products to site under provisions of Section 26 03 05-1.07.
- B. Store and protect products under provision of Section 26 03 05-1.07.

PART 2 PRODUCTS

2.01 LUMINARIES AND ACCESSORIES

- A. Luminaries shall be as indicated.

2.02 LAMPS

- A. General Use Incandescent Lamps: Inside frosted type, rated 130 volts.
- B. Incandescent Reflector Lamps: Shape as scheduled, rated 130 volts.
- C. Fluorescent Lamps: 32 watt, T8 diameter, medium bipin base minimum CRI shall be 80. Color temperature shall be 4100 K. Use one color only.

2.03 BALLASTS

- A. Ballasts: ANSI C82.1; programmed start, parallel electronic, less than 20% THD type. Ballasts shall be quiet type with minimum "A" sound rating. Ballast shall be able to operate either F32(25 watt), F32(28 watt) or F32 type lamps, all of the same type at one time, without any modification or wiring changes.
- B. High Intensity Discharge (HID): ANSI C82.4 metal halide and high pressure sodium suitable for

lamp specified.

2.04 WARRANTY

- A. For all 4-foot fluorescent lamp fixtures, provide a lamp ballast combination with a minimum 5 year ballast warranty. Warranty shall include full replacement cost including material and labor required to replace failed ballast and provide new lamps connected to the ballast.

PART 3 EXECUTION

3.01 INSTALLATION

- A. Install lamps in luminaires and lampholders.
- B. Support surface-mounted luminaires directly from building structure or fasten to T using bolts, screws, rivets, or approved ceiling framing member clips.
- C. Install recessed luminaires to permit removal from below.

3.02 RELAMPING

- A. Relamp luminaires which have failed lamps at completion of Work.

3.03 ADJUSTING AND CLEANING

- A. Align luminaires and clean lenses and diffusers at completion of Work. Clean paint splatters, dirt, and debris from installed luminaires.

3.04 LUMINAIRE SCHEDULE

- A. Luminaries as scheduled on the Drawings are the basis for the lighting design.
- B. Substitutions may be made according to specifications sections 00 21 13, "Instructions to Bidders" and 01 60 00, "Product Requirements."

END OF SECTION

SECTION 27 13 43

COMMUNICATIONS CIRCUIT PATHWAYS

PART 1 GENERAL

1.01 SUMMARY

- A. Section includes arrangement with Telecommunications Utility Company for telecommunication service; payment of Utility Company charges for service installation; and backboards, cabinets, cable tray, raceways, and boxes.
- B. Related Sections:
 - 1. Section 09 90 00 - Painting: Painting backboards.
 - 2. Section 09 90 00 - Painting and Coating: Painting backboards.
 - 3. Section 26 05 34 - Floor Boxes for Electrical Systems.
 - 4. Section 26 27 26 - Wiring Devices: Wall plates.
 - 5. Section 26 05 26 - Secondary Grounding and Bonding
 - 6. Section 27 05 33 - Conduits and Backboxes for Communications Systems.

1.02 REFERENCES

- A. International Electrical Testing Association:
 - 1. NETA ATS - Acceptance Testing Specifications for Electrical Power Distribution Equipment and Systems.
- B. Telecommunications Industry Association/Electronic Industries Alliance:
 - 1. TIA/EIA 568 - Commercial Building Telecommunications Cabling Standard.
 - 2. TIA/EIA 569 - Commercial Building Standard for Telecommunications Pathways and Spaces.
- C. American Society for Testing and Materials:
 - 1. ASTM A123 - Specification for Zinc (hot dipped galvanized coatings on iron and steel).
 - 2. ASTM A510 - Specification for general requirements for wire rods and course round wire, carbon steel.
 - 3. ASTM B633 - Specification for electro-deposited coatings of zinc on iron and steel.
- D. National Electrical Manufacturers Association:
 - 1. NEMA VE2-2000 - Cable tray installation guidelines.

1.03 SYSTEM DESCRIPTION

- A. Service entrance from Telecommunications Utility Company.
- B. Service Entrance Pathway: Empty ducts and raceway from point of Telephone Utility connection at property line to building service terminal backboard.
- C. Entrance Wiring: By Telephone Utility Company.
- D. Backbone Wiring: By Owner.
- E. Horizontal Wiring: By Owner.

1.04 SUBMITTALS

- A. Section 26 03 05 - Submittal Procedures: Submittal procedures.
- B. Product Data: Submit catalog data for cable tray, raceways and boxes.

1.05 CLOSEOUT SUBMITTALS

- A. Project Record Documents: Record actual locations and sizes of pathways and outlets.

1.06 COORDINATION

- A. Contact utility company regarding charges related to service installation. Include utility charges in this contract.

PART 2 PRODUCTS

2.01 TELEPHONE TERMINATION BACKBOARDS

- A. Material: Fire retardant Plywood.
- B. Size: As indicated on Drawings, 3/4 inch thick.

2.02 TELEPHONE/DATA OUTLETS

- A. Provide telephone/data outlets consisting of 4 inch square X 1-1/2 inch deep box with single gang plaster rings where shown.
- B. Provide 3/4 inch conduit from box to above ceiling and turned out perpendicular to wall, 6 inches from wall with plastic bushing attached to conduit or connector.
- C. Provide a pull string in all conduits.

2.03 TELEPHONE/DATA FLOOR OUTLETS

- A. Provide conduit underfloor from communication section of floor boxes to telephone terminal boards. Conduits shall extend above finished floor 12 inches.
- B. Provide plastic bushing on all underfloor conduits.
- C. Provide pull string in all conduits.

PART 3 EXECUTION

3.01 INSTALLATION

- A. Install pathways in accordance with TIA/EIA 569.
- B. Finish paint termination backboards with durable white enamel in accordance with Section 09 90 00 prior to installation of any equipment.
- C. Install termination backboards and cabinets plumb, and attach securely to building wall at each corner.
- D. Install polyethylene pulling string in each empty telephone conduit over.
- E. Install engraved plastic nameplates in accordance with Section 26 05 53. Mark backboards and cabinets with legend "TELEPHONE."
- F. Ground and bond pathways, cable shields, and equipment in accordance with Section 26 05 26.

END OF SECTION

SECTION 28 31 00

FIRE ALARM AND SMOKE DETECTION SYSTEMS

PART 1 - GENERAL

1.1 SECTION INCLUDES

- A. Fire alarm and smoke detection systems.

1.2 WORK INCLUDES

- A. Section includes fire alarm system replacement with new, addressable control panel with voice evacuation, fire alarm terminal cabinets, manual fire alarm stations, automatic smoke and heat detectors, fire alarm signaling appliances, and auxiliary fire alarm equipment and power and signal wire and cable.

1.3 REFERENCES

- A. NFPA 72 - 2007 National Fire Alarm Code.
- B. NFPA 101 - 2006 Life Safety Code.
- C. Florida Fire Prevention Code - 2007 edition.

1.4 REGULATORY REQUIREMENTS

- A. System: UL and FM listed.
- B. Conform to requirements of NFPA 101.

1.5 SYSTEM DESCRIPTION

- A. Provide a new Silent Knight IntelliKnight 5820XL-EVS Addressable Fire Alarm Control with Emergency Voice System, or approved equal product, with all new devices and wiring to replace existing.
- B. Provide new devices and wiring to replace existing throughout the building.
- C. All new equipment and materials shall be compatible with the new Silent Knight system.
- D. Fire Alarm System: NFPA 72, manual and automatic local fire alarm system.
- E. Alarm Sequence of Operation: Actuation of initiating device causes the following system operations:
 - 1. Local fire alarm signaling devices sound and display signal.
 - 2. Non-coded signal transmits to remote station monitoring equipment.
 - 3. Location of alarm device indicates on fire alarm control panel.
 - 4. Signal transmits to building mechanical controls, shutting down fans and operating dampers.
- F. Drill Sequence of Operation: Manual drill function causes alarm mode sequence of operation.
- G. Trouble Sequence of Operation: System or circuit trouble causes the following system operations:
 - 1. Visual and audible trouble alarm indicates by device at fire alarm control panel.

1.6 QUALIFICATIONS

- A. Manufacturer: Company specializing in smoke detection and fire alarm systems with five years documented experience.
- B. Installer: Company specializing in smoke detection and fire alarm systems with 2 years documented experience, certified as fire alarm installing contractor.

1.7 SUBMITTALS

- A. Submit shop drawings and product data under provisions of Section 26 03 05.
- B. Provide wiring diagrams, data sheets, and equipment ratings, layout, dimensions, and finishes.
- C. Submit manufacturer's installation instructions under provisions of Section 26 03 05.
- D. Submit manufacturer's certificate under provisions of Section 26 03 05, that system meets or exceeds specified requirements.

1.8 OPERATION AND MAINTENANCE DATA

- A. Submit data under provisions of Section 26 03 05.
- B. Include operating instructions, and maintenance and repair procedures.
- C. Include manufacturer representative's letter stating that system is operational.

1.9 DELIVERY, STORAGE, AND HANDLING

- A. Deliver products to site and store and protect products from adverse weather.

1.10 EXTRA MATERIALS

- A. Provide the following spare parts:
- B. Provide two keys of each type.

1.11 WARRANTY

- A. The Contractor shall warrant the equipment to be new and free from defects in material and workmanship and will, within five years from Date of Final Acceptance, repair or replace all or any part of the equipment found to be defective. Damage by lightning shall be included in the warranty. This warranty shall not apply if damage is caused by abuse, accident, improper operation, or negligence. Warranty maintenance shall be provided by the Contractor during his normal working hours at no expense to the Owner.
- B. Provide manufacturer's warranty and authorized preventative maintenance services for a period of three years from the date of Final Acceptance. Warranty shall include full replacement cost including material and labor required to replace any component of the fire alarm systems.

1.12 TRAINING

- A. Provide 16 hours of training in multiple sessions, each not to exceed 8 hours in length.
- B. Use approved shop drawings and operation and maintenance data to detail normal and emergency operation and repair procedures.

PART 2 - PRODUCTS**2.1 FIRE ALARM AND SMOKE DETECTION CONTROL PANEL**

- A. The fire alarm control panel (FACP) shall be a Silent Knight model 5820XL analog addressable control panel. Substitution of the panel from a different manufacturer shall not be allowed.
- B. The FACP must have a 6 amp power supply and be capable of expansion to a maximum of 54 total amps via bus connected expander modules that supervise low battery, loss of AC and loss of communication.
- C. The FACP must have Drift Compensation sensitivity capabilities on detectors and be capable of supporting 99 detectors and 99 analog addressable modules and expandable to a maximum of 396 detectors and 396 modules. This shall be accomplished via four signaling line circuits (SLC) capable of supporting a minimum of 99 detectors and 99 addressable module devices each. The communication protocol on the SLC loop must be digital.
- D. The FACP must support a minimum of six programmable "Flexputs". The panel must have a built in 80 character LCD annunciator with the capability of having an additional eight supervised remote annunciators connected in the field.
- E. The FACP must have a built in UL approved digital communicator. The communicator must allow local and remote up/downloading of system operating options, event history, and detector sensitivity data.
- F. The FACP must automatically test the smoke detectors in compliance with NFPA standards to ensure that they are within listed sensitivity parameters and be listed with Underwriters Laboratories for this purpose.
- G. The FACP must compensate for the accumulation of contaminants that affect detector sensitivity. The FACP must have maintenance alert feature (differentiated from trouble condition), detector sensitivity selection, auto-programming mode (Jumpstart) and the ability to upgrade the core operating software on site or over the telephone.
- H. The FACP shall have a Jumpstart feature that can automatically enroll all properly connected accessories into a functional system within 60 seconds of powering up the panel. Panels that do not have these capabilities will not be accepted.
- I. The main communication bus (S-Bus RS485) shall be capable of class A or class B configuration with a total Bus length of 6,000 feet.

2.2 FIRE ALARM VOICE EVACUATION PANEL

- A. The fire alarm voice evacuation panel (FAVP) unit shall be a Silent Knight model SKE-450 system. Substitution of the panel from a different manufacturer shall not be allowed.
- B. The voice annunciation unit shall provide 25 watts signal power and 25 watts voice power, and shall be UL listed.
- C. The voice annunciation unit shall be micro-processor based, and shall contain an integral microphone, 25-watt audio amplifier, tone generator, digital message repeater, 120 VAC power supply and battery charger.
- D. The voice annunciation message/signal shall be broadcast until the Fire Alarm Control Panel (FACP) is reset, or until fire emergency personnel interrupt the broadcast with a manual page. On reset system shall automatically return to standby (normal operating) condition.
- E. A secondary message shall be provided which can be triggered by the closure of a contact from either the FACP or from any normally open contact device.

- F. Remote paging microphone(s) will be supported by the system through a supervised circuit. Remote microphone(s) may be mounted up to 5000 feet from the voice annunciation panel.

2.3 FIRE ALARM EXPANDER PANEL

- A. The fire alarm expander panel (FAEP) shall be a Silent Knight model 5895XL intelligent power module.
- B. The contractor shall supply a power module compatible with the IntelliKnight Model 5820XL FACP. The power module must have 6.0 amps of output power, Flexput I/O circuits rated 3.0 amps each, and two Form C relay contacts rated at 2.5 amps at 24 VDC. The power module shall connect to the main FACP via an RS-485 system bus (SBUS). The power module shall contain an additional RS-485 bus that is completely compatible with all IntelliKnight add-on modules, including 5815XL SLC expander's, 5860 remote annunciators, 5824 serial/parallel printer interface modules.
- C. The power module RS-485 bus shall be optically isolated providing ground loop isolation and transient protection. The unit shall be an SBUS repeater that conditions the signal driving up to 6,000 feet of additional

2.4 FIRE ALARM TERMINAL CABINET

- A. Fire alarm terminal cabinets shall house expansion modules for signal line circuits and power modules for notification circuits.
- B. The system cabinet shall be red and can be either surface or flush mounted. The cabinet door shall be easily removable to facilitate installation and service.
- C. An audible system trouble sounder shall be an integral part of the control unit. Provisions shall also be provided for an optional supervised remote trouble signal.
- D. The terminal cabinet shall operate on 24 VDC, filtered switch mode power supply with the rated current available of 5 Amps. The FACP must have a battery charging circuit capable of complying with the following requirements:
 - 1. Sixty (60) hours of battery standby with five (5) minutes of alarm signaling at the end of this sixty (60) hour period (as required per NFPA 72 remote station signaling requirements) using rechargeable batteries with automatic charger to maintain standby gel-cell batteries in a fully charged condition.

2.5 System Wiring

- A. The SLC and Data Communication Bus shall be wired with standard NEC 760 compliant wiring, no twisted, shielded or mid capacitance wiring is required for standard installations. All FATC screw terminals shall be capable of accepting 14-18 AWG wire.
- B. Signaling Line Circuits: Each SLC shall be capable of a wiring distance of 10,000 feet from the SLC driver module and be capable of supporting 127 devices. The communication protocol to SLC devices must be digital. Any SLC loop device, which goes into alarm, must interrupt the polling cycle for priority response from the FACP. The FACP must respond consistently to a device that goes into alarm on an SLC in under 3 seconds. The auxiliary 5815XL SLC loop module must be capable of being located up to 6000 feet from the FACP on an RS-485 bus, which is separate from the SLC bus. The SLC shall be capable of functioning in a class A or class B configuration.
- C. SLC loop devices: Devices supported must include analog photoelectric, ionization smoke detectors, analog heat detectors, contact monitoring modules and relay output modules. There is to be no limit to the number of any particular device type up to the maximum of 127 that can be connected to the SLC.

2.6 ADDRESSABLE INITIATING DEVICES

- A. Addressable Pull Station: Provide manual stations as shown. Stations shall be red, single action, of the non coded type with terminals and contain a key reset switch for positive resetting action and shall be available with an optional break glass rod. The manual station shall be used with the Addressable Monitor Module. The manual station shall mount to a standard single gang switch box or on an optional red surface mount box.
1. Manual Stations shall be installed in conjunction with an Addressable Input Module. Manual Stations shall be Silent Knight Models SD500-PS (MIM included) and Underwriters Laboratories listed.
- B. Smoke Detectors & Accessories
1. Addressable detector functions: The products of combustion detectors must communicate analog values using a digital protocol to the control panel for the following functions:
 - a. Automatic compliance with NFPA 72 standards for detector sensitivity testing
 - b. Drift compensation to assure detector is operating correctly
 - c. Maintenance alert when a detector nears the trouble condition
 - d. Trouble alert when a detector is out of tolerance
 - e. Alert control panel of analog values that indicate fire.
- C. Smoke Detector - Photoelectric
1. Provide analog/addressable photoelectric smoke detectors at the locations shown on the drawings. Detectors shall be the Silent Knight Model SD505-APS Addressable Photoelectric Smoke Detector. The base shall be the Silent Knight model SD505-6AB. The Smoke detector shall have a flashing status LED for visual supervision. When the detector is actuated, the flashing LED will latch on steady at full brilliance. The sensitivity of the detector shall be capable of being measured by the control panel without the need for external test apparatus. The detector shall be a double EE-prom technology and be programmed using the internal programming loop located on the FACP.
- D. Duct Detector - All Duct Detectors shall be Silent Knight Model SD505-ADH housings with the Model SD505-APS detector.
- E. Remote Indicator/Test Switch - Provide remote indicator/test switches for all smoke detectors, (ceiling and duct) where required by code. Indicators may not be shown on plans. Indicator module shall have separate LEDs that indicate normal or alarm condition. Module shall have a momentary key switch for testing of the duct detector. Module shall be Silent Knight Model SD505-DTS.
- F. Heat Detectors - Heat detectors shall be Silent Knight Model SD505-AHS (heat) detector.

2.7 GENERAL NOTIFICATION APPLIANCES

- A. All appliances shall be U.L. Listed for Fire Protective Service.
- B. All strobe appliances or combination appliances with strobes shall be capable of providing the "Equivalent Facilitation" which is allowed under the Americans with Disabilities Act Accessabilities Guidelines (ADA(AG)), and shall be UL 1971, UL 1638, and ULC S526 Listed.
- C. Furnish and install where shown on the plans:
1. Strobes shall provide 75 cd or 110 cd synchronized flash output. cd shall be based on room size per NFPA.
 2. Speakers:

- a. Low Profile Speaker: Provide low profile wall mount speakers at the locations shown on the drawings. The low profile speaker shall not extend more than 1" (2.5cm) past the finished wall surface, and provide a switch selectable audible output of 2W (90dBA), 1W (87dBA), 1/2W (84dBA), or 1/4W (81dBA) at 10 ft. when measured in reverberation room per UL-464.
 - b. Wattage setting shall be visible with the cover installed. When the cover is installed, no mounting hardware shall be visible. In and out screw terminals shall be provided for all wiring. The low profile speaker shall mount in a North American 4" x 2 1/8" square electrical box, without trims or extension rings.
3. Speaker-Strobes:
- a. Low Profile Speaker-Strobe: Provide low profile wall mount speaker/strobes at the locations shown on the drawings. The low profile speaker/strobe shall not extend more than 1" (2.5cm) past the finished wall surface, and provide a switch selectable audible output of 2W (90dBA), 1W (87dBA), 1/2W (84dBA), or 1/4W (81dBA) at 10 ft. when measured in reverberation room per UL-464.
 - b. Strobes shall provide synchronized flash output, that shall be switch selectable for output values of 75cd & 110cd. Wattage and candela settings shall be visible with the cover installed. When the cover is installed, no mounting hardware shall be visible. In and out screw terminals shall be provided for all wiring. The low profile speaker/strobes shall mount in a North American 4" x 2 1/8" square electrical box, without trims or extension rings.

2.8 FIRE ALARM WIRE AND CABLE

- A. Fire Alarm Power Branch Circuits: Building wire as specified in Section 26 05 19.
- B. Initiating Device and Indicating Appliance Circuits: Non-power limited fire-protective signaling cable, copper conductor, 150 volt insulation rated 60 degrees C, 18 AWG pairs.

2.9 ELECTROMAGNETIC DOOR HOLDERS

- A. Electromagnetic Door Holders shall be constructed of durable die-cast metal finished in high luster chrome. The electromagnetic door holders shall include dual voltage AC or DC inputs of 24 & 120volts and low current draw of 0.020 mA at 24VDC. Units shall be surface mount with wall mounted back box. Units shall have available options for extensions and misalignment rods. Door holders shall have minimum holding force of 35 pounds and low residual magnetism. Door Holders shall be compatible with Fire Alarm Control Panel. Door Holders shall be UL listed.
- B. Mount door holders at top of doors and at the distance from the strike side of the door as recommended by the door manufacturer.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Provide and install the system in accordance with the plans and specifications, all applicable codes and the manufacturer's recommendations. All wiring shall be installed in strict compliance with all the provisions of NEC - Article 760 A and C, Power-Limited Fire Protective Signaling Circuits or if required may be reclassified as non-power limited and wired in accordance with NEC - Article 760 A and B. Upon completion, the Contractor shall so certify in writing to the Owner and General Contractor. All junction boxes shall be sprayed red and labeled "Fire Alarm". Wiring color code shall be maintained throughout the installation.
- B. Fire Alarm Control Panel and Fire Alarm Terminal Cabinet shall be mounted with the center of panel 60 inches above floor level.
- C. The Fire Alarm Control Panel and Fire Alarm Terminal Cabinet shall be connected to a

separate, dedicated branch circuit, maximum 20 amperes. This circuit shall be labeled at the Main Power Distribution Panel as FIRE ALARM. Fire Alarm Control Panel Primary Power wiring shall be 12 AWG. The Control Panel Cabinet shall be grounded securely to either a cold water pipe or grounding rod. Conduit shall enter into the Fire Alarm Control Panel back box only at those areas of the back box which have factory conduit knockouts.

- D. Installation of equipment and devices that pertain to other work in the Contract shall be closely coordinated with the appropriate subcontractors.
- E. The Contractor shall clean all dirt and debris from the inside and the outside of the fire alarm equipment after completion of the installation.
- F. The manufacturer's authorized representative shall provide on site supervision of installation.
- G. Install manual station with operating handle 48 inches above floor. Install audible and visual signal devices 80 inches above floor except where lockers, bookcases or other furniture will obscure device. Raise devices to 12" above obstruction where necessary.
- H. Install all fire alarm wiring in conduit.
- I. Cable shall be the type listed for Fire Alarm/Life Safety use and shall be installed per NEC Article 760. Cable must be separated from any conductors of Power, or Class 1 circuits, and shall not be placed in any conduit, junction box or raceway containing these conductors, as per NEC Article 760-29.
- J. Make conduit and wiring connections to sprinkler flow switches, sprinkler valve tamper switches, duct smoke detectors, and AHU shutdown devices.
- K. Automatic Detector Installation: NFPA 72. Coordinate with mechanical contractor to install and connect smoke detectors in HVAC ductwork.
- L. Provide remote indicators/test switches for all smoke detectors (ceiling and duct) where required by code and where detector is not visible from a standing position on the floor below the detector. Wall mount detectors at 60" above finished floor. Provide conduit, surface metal raceway and junction boxes as required to mount device.
- M. All splices, taps and terminations of fire alarm conductors shall be made on binder head screw terminals only.

3.2 MANUFACTURER'S FIELD SERVICES

- A. Provide manufacturer's field services. The Manufacturer shall provide the on-site services of an Authorized, Factory Trained technical representative to supervise all connections and fully test all devices and components of the system during installation phase. The system shall be demonstrated to perform all the functions as specified.
- B. The Supplier shall provide comprehensive Training on the operation, proper use, testing and routine maintenance of the installed Fire Alarm System to the Building Owner's Representative.
- C. The completed fire alarm system shall be fully tested in accordance with NFPA 72 by the Contractor in the presence of the Owner's representative and the Local Fire Marshal. Upon completion of a successful test, the Contractor shall so certify in writing to the Owner and General Contractor.

3.3 FINAL SYSTEM ACCEPTANCE

- A. The Fire Alarm System will be accepted only after a satisfactory test of the entire system has been accomplished by a Factory-Trained Supplier in the presence of a representative of the Owner.

- B. The Supplier shall provide a complete set of "as-built" Fire Alarm/Life Safety system drawings at Substantial Completion.
- C. Provide the following in addition to as-built drawings:
 - 1. A computer file of the compiled Data Transfer Files for the installed system. (This file is intended to be a backup database for the installed system, and is not intended to be modified by any party other than the installing Engineered Systems Distributor.)
 - 2. Reports of all testing performed during installation of the system.
 - 3. Procedures for testing the Fire Alarm / Life Safety System.
- D. The Supplier shall make available contracted periodic system testing, maintenance, and/or calibration services.

3.4 WARRANTY

- A. The Contractor shall warrant the completed fire alarm system wiring and equipment to be free from inherent mechanical and electrical defects for a period of five years from the date of the completed and certified test or from the date of first beneficial use.
- B. The Fire Alarm Systems Components including all Control Equipment, Analog Sensors and Addressable I/O Modules shall be warranted by the manufacturer for five years. Damage by lightning shall be included in the warranty.
- C. Upon completion of the installation of the fire alarm system equipment, the electrical contractor shall provide to the architect, a signed written statement, substantially as follows:

"The undersigned, having engaged as the contractor on the (NAME OF THE PROJECT) confirms that the fire alarm system equipment installed is in agreement with the wiring diagrams and written instructions and directions provided by the Engineered Systems Distributor."

END OF SECTION

SECTION 31 00 00

EARTHWORK

PART 1 - GENERAL

1.01 RELATED DOCUMENTS: The General Provisions of the Contract, including the General Conditions, Supplementary Conditions and Special Conditions, along with the General Requirements, apply to the work specified in this Section.

1.02 DESCRIPTION:**A. Work Included:**

1. Notification of Utility Companies.
2. Protection.
3. Stripping and Stockpiling Topsoil.
4. Overexcavation & Removal of Unsuitable Soils.
5. Slope Restrictions, Shoring & Bracing of Excavations.
6. Existing Soil Compaction & Preparation.
7. Fill Placement.
8. Layout & Establishment of Grades.
9. Grading and Reshaping Site.
10. Spreading of Topsoil.
11. Repair & Restoration.
12. Clean Up.

B. Related Work Specified Elsewhere:

1. Site Clearing; Grubbing and Stripping: 312000.

1.03 REFERENCES:**A. American Society for Testing and Materials (Latest Edition):**

1. ASTM D-698, 'Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Standard Effort'.
2. ASTM D-1140, 'Standard Test Methods for Amount of Material in Soils Finer Than the No. 200 Sieve.'
3. ASTM D-1557, 'Test Method for Laboratory Compaction Characteristics of Soil Using Modified Effort'
4. ASTM D-2216, 'Standard Test Method for Laboratory Determination of Water (Moisture) Content of Soil and Rock'
5. ASTM D-2487, 'Standard Classification of Soils for Engineering Purposes (Unified Soil Classification System)'
6. ASTM D-2922, 'Standard Test Methods for Density of Soil and Soil-Aggregate in Place by Nuclear Methods (Shallow Depth)'

7. ASTM D-2974, 'Standard Test Methods for Moisture, Ash, and Organic Matter of Peat and Other Organic Soils.'
 8. ASTM D-3017, 'Standard Test Method for Water Content of Soil and Rock in Place by Nuclear Methods (Shallow Depth)'
 9. ASTM D-4318, 'Standard Test Method for Liquid Limit, Plastic Limit and Plasticity Index of Soils.'
 10. ASTM D-5268, 'Standard Specification for Topsoil Used for Landscaping Purposes.'
 11. ASTM D-6913, Standard Test Methods for Particle-Size Distribution (Gradation) of Soils Using Sieve Analysis
- B. Florida Department of Transportation (FDOT):
1. Standard Specifications for Roadway & Bridge Construction.
- C. Florida Statutes (F.S.):
1. Chapter 556: Underground Facility Damage Prevention and Safety.
 2. Chapter 553: Trench Safety Act.
- D. Occupational Safety and Health Administration (OSHA):
1. 29 C.F.R. Part 1926

1.04 JOB CONDITIONS:

- A. Inspection of the Site: It is the Contractor's responsibility to have carefully inspected the Site during the bidding period to determine the extent and nature of the site work and the conditions under which it must be performed.
- B. Subsurface investigations have been completed. A copy of the Geotechnical Investigation is included in Section 020600.
- C. Lines, Grades, Etc.: Verify all grades, lines and dimensions shown on Drawings and report any errors or inconsistencies to the Engineer before commencing work.
- D. Should any unusual conditions arise, contact the Engineer for instructions prior to continuation of Earthwork operations.
- E. Soil excavated from the site and not used in the performance of the work shall remain the property of the Owner until Owner relinquishes rights to the material in writing to the Contractor, at which time said material shall be removed from the site.

1.05 QUALITY ASSURANCE:

- A. Work specified herein will be subject to inspection and testing by an independent testing laboratory selected and compensated by the Contractor. Selection of the testing laboratory is subject to the approval of the Engineer.

B. Testing: Contractor shall employ (at the Contractors expense) a geotechnical firm capable of performing the below compliance testing at the indicated intervals. Geotechnical firm subject to Engineers approval.

1. The minimum compaction testing (ASTM D 1557) shall be as follows for each lift of fill:

- a. One (1) test per 3,000 SF under pavement area.
- b. One (1) test per 3,000 SF of all other areas.

In the event an above item is not constructed on fill, the areas shall be tested as if one (1) lift of fill had been put in place.

2. Additionally, the following elements shall be tested (ASTM D2922) for compliance with the compaction requirements (ASTM D1557) to a depth of 12" below the bearing elevation of each element.

- a. One (1) test per 300 LF of utility trench.
- b. One (1) test at each utility structure.
- c. One (1) test for each 50 LF of continuous footing.
- d. One (1) test for each 2,500 sf of building slab.
- e. One (1) test for each isolated footing

3. Representative samples of each source of suitable fill shall be collected and tested for optimum moisture content (ASTM D2216), gradation (ASTM D6913) and plasticity (ASTM D4318) characteristics. Tests shall be performed to establish moisture density relationships and fill suitability in accordance with the modified proctor method (ASTM D1557).

4. Imported Topsoil Material shall be tested as follows for each source material:

- a. pH.
- b. Determine organic material content by ASTM D-2974.
- c. Presence of Herbicides.

C. Field Engineering & Layout:

- 1. The Owner has established the lot line bearings and project benchmark elevation.
- 2. The Contractor shall employ and pay for the services of a Florida licensed surveyor who shall make all required surveys for establishing all points, lines, grades and levels, and otherwise fully and completely lay out all the work required by the Contract.

- D. Trench Safety Act: Excavations shall comply with the requirements of the Florida Trench Safety Act (F.S., Chapter 553, Part III).

1.06 SUBMITTALS:

- A. Copies of all soils testing showing compliance with this section. Copies of all retests as required.
- B. Shoring and bracing plans for excavations if required. Signed and sealed by a Florida Registered Professional Engineer.
- C. Certification that trench excavations will comply with the Florida Trench Safety Act.

PART 2 - PRODUCTS

2.01 MATERIALS:

- A. Suitable On-Site or Imported Fill/Backfill:
1. Well graded material conforming to ASTM D 2487 (SW, SP) free from debris, organic material, fat clays, brick, lime, concrete, and other material which would prevent adequate performance of the backfill.
 2. Fill shall consist of an inorganic, non-plastic, granular soil containing less than 10 percent material passing the No. 200 mesh sieve.
 3. All fill proposed for use at the site whether from on-site grading operations or an off-site source shall be tested as outlined in Paragraph 1.05B.
- B. Topsoil:
1. Well graded sandy material with composted organic content in accordance with ASTM D-5268.
 2. Material shall be friable, free draining, surface soil reasonably free of grass, roots, weeds, sticks and trash.
 3. Material shall be free of odors.
 4. Material shall have a pH between 5.9 and 7.0 unless otherwise required by the sod supplier or landscaper.
 5. Topsoil shall be tested as outlined in 310000 (1.05) B.4.

C. Crushed Stone:

1. Washed, narrowly graded mixture of crushed stone, or crushed or uncrushed gravel; ASTM D448; coarse-aggregate grading Size 57; with 100 percent passing a 1-1/2 inch sieve and 0 to 5 percent passing No. 8 sieve.

D. Pipe Bedding and Haunching Material:

1. Natural subgrade or backfilled material shall meet the requirements of the Unified Soil Classification for SW or SP material or AASHTO Soil Classification for A-3 material.

PART 3 - EXECUTION**3.01 NOTIFICATION OF UTILITY COMPANIES:**

- A. Notify all utility companies that may have lines or services on or around the site prior to starting any work. Have the utility identify and locate their underground lines.
- B. Active utilities shall be adequately protected from damage and removed or relocated only as indicated or specified. The work shall be adequately protected, supported or relocated as directed by the Engineer. Take responsibility for the repair or replacement of any lines or services damaged during the course of this work.
- C. Remove, plug or cap all abandoned lines, meters, boxes, obstructions or piping in accordance with the requirements and approval of the agencies affected or as directed by the Engineer. Use licensed electricians or plumbers for this work.

3.02 PROTECTION:

- A. The Contractor shall design, furnish, place, and maintain all trench safety, support, shoring, and sheet piling which may be required for the protection of site personnel and adjacent existing improvements.
- B. Maintain all bench marks, monuments and other reference points furnished by others and replace any that are disturbed or destroyed during the course of the work.
- C. Protect any trees or shrubs remaining within the vicinity of the work, or as indicated to remain on drawings. Refer to Section 312000 for related requirements.

3.03 STRIPPING AND STOCKPILING OF TOPSOIL:

- A. Strip all topsoil from the excavation areas and stockpile it on the site as directed by the Engineer or Owner and as described in Section 312000.
- B. Where additional topsoil is required for finish grading, it shall be equal to the topsoil of the surrounding area. All topsoil shall be kept clean and free of weeds and refuse.
- C. Any additional topsoil necessary to achieve final grades shall be provided at the Contractor's expense.
- D. Unless claimed by the Owner, topsoil not used in final grading shall be removed from the site.

3.04 OVEREXCAVATION, REMOVAL AND REPLACEMENT OF UNSUITABLE SOILS:

- A. General: A Geotechnical Report has been prepared for this project. Clay rich soils (SC, ML, CL, MH, CH) and organic rich soils (Pt, OL, OH) under the project site shall be defined as unsuitable material. If encountered, this material is not suitable for use as backfill. The removal of unsuitable materials is mandatory and shall be included in the Contractor's base bid. Extent and conditions for soil removal shall be as follows:

- 1. New Buildings and Equipment Pads:
 - a. Vertical removal of all clay rich soils beneath the bearing elevation of the foundation shall be to a depth of 12".
 - b. Horizontal limits removal of clay rich soils shall be extended 1 foot beyond the perimeter of the bearing element.
 - c. Overexcavation of organic rich soils shall be full depth or 10' whichever is greater for an area extending 5' beyond the structure footprint.
 - d. Backfill excavations with compacted suitable material.
- 2. All Utility Structures, Paving Areas and Underground Piping:
 - a. Where unsuitable material occurs at subgrade elevations within the limits of construction, the Contractor shall excavate such material (for the width of the excavation) down to suitable foundation material or to a depth of one foot whichever is less and backfill with suitable material obtained from grading operations, borrow or imported fill.
 - b. Backfill excavations with compacted suitable material.

3.05 SLOPE RESTRICTIONS, SHORING & BRACING OF EXCAVATIONS:

- A. Excavations exceeding 5 feet in depth shall comply with the Trench Safety Act (F.S. 553.60-64) and shall employ the requirements of 3.05 (B) or 3.05 (C) as applicable.
- B. Excavation walls adjacent to existing structures and pavements, such that foundations or bearing elements could be undermined, shall be laterally supported by sheet piles.
 - 1. Contractor shall at his expense design and install sheet piles.
 - 2. System shall use walers, tie-backs or deadman as necessary to prevent movement of soils under or adjacent to existing structures.
 - 3. System shall be designed under the supervision of a Florida Registered Professional Engineer.
 - 4. The use of jetting to install sheet piles is not allowed.
 - 5. Refer to the Geotechnical Report for design soil pressures.
 - 6. Upon completion of excavation activities all shoring & bracing materials shall be removed.
- C. Excavations not adjacent to existing structures may be open cut.
 - 1. Excavation walls greater than 5 feet in depth shall not exceed 2:1 (H:V).
 - 2. Limits of excavation shall not advance beyond the property or right-of-way line.
 - 3. Slopes shall be protected from erosion.
 - a. Construct a perimeter berm redirecting stormwater.
 - b. Apply an impervious sheeting covering slopes during rain events as necessary.
 - 4. Excavation slopes shall be terraced every 5 feet vertically with a 4 foot wide continuous terrace. A shallow drainage ditch, 8-inches deep, shall be cut at the toe of each slope to collect stormwater.
 - 5. In lieu of 2:1 (H:V) sideslopes the Contractor may utilize a steel trench box and ladder designed for the purpose of protecting workers in steep wall excavations.
- D. See Section 312319 for groundwater control requirements.

- E. All utilities exposed by the excavation shall be supported or redirected as required to remain in service.

3.06 EXISTING SOIL COMPACTION AND PREPARATION:

- A. Subsequent to clearing and stripping, compact the upper 12 inches of exposed surficial sandy soils to the requirements of Paragraph B of this section.
1. Use vibratory equipment (2 to 4 ton static weight roller, 2' to 3' drum diameter) as allowed by groundwater levels and proximity to existing structures.
 2. Provide a minimum of 8 passes.
 - a. Provide an equal number of passes in directions perpendicular to each other.
 3. Do not operate large roller within 15' of existing buildings. Within 15' of existing buildings use walk behind compaction equipment not exceeding 1,500 lbs.
- B. Minimum compaction requirements (per ASTM D1557) for excavations in or activities on existing soils shall be as follows:
- | | |
|--|-----|
| 1. Foundations, slabs and sidewalks | 95% |
| 2. Paving areas | 98% |
| 3. Utility trenches/pipelines and structures | 98% |
| 4. Landscaping and athletic fields | 90% |
| 5. All other areas | 85% |
- C. If encountered, surficial exposed clayey soils should not be compacted.
1. Assess suitability of soil and determine limits of overexcavation as necessary.
 2. Cover exposed clayey soils as soon as possible with suitable fill, limit access to area until soil has been covered and protected from further disturbances.
- D. After completion of compaction activities, proofroll existing surface with a heavy, pneumatic tired vehicle such as a fully loaded dump truck.
1. Remove and replace soft soils with suitable fill.
 2. Recompact and retest area.
 3. Proofrolling shall consist of (2) two complete passes of the vehicle in opposite directions.

3.07 FILL PLACEMENT:

- A. All fill material, whether from on-site or imported material, must be approved by the Geotechnical Engineer, hired and compensated by the Contractor, prior to placing it on the site.
- B. Backfill Placement:
1. Within 15 feet of existing structures:
 - a. Compact soils with light (1,500 pounds or less) walk behind vibratory rollers or sleds.
 - b. Heavy (2 tons or greater) vibratory equipment shall not be allowed.
 - c. Place loose lifts not exceeding 6 inches.
 2. With 24" or less separation between compaction surface and groundwater table:
 - a. Place loose lifts not exceeding 18 inches in depth.
 - b. Compact each lift using non-vibratory equipment.
 3. With greater than 24" separation between compaction surface and groundwater table:
 - a. Place loose lifts not exceeding 12 inches in depth.
 - b. Compact each lift using vibratory equipment.
 4. Regardless of compaction achieved all lifts shall receive a minimum of 8 passes of the compaction equipment. Provide an equal number of passes in directions perpendicular to each other.
- C. Compact each lift with 2 to 4 ton static weight vibratory roller until the following % of the maximum dry density (per modified proctor max. dry density, ASTM D 1557) is obtained.
- | | |
|--|-----|
| 1. Foundations, Slabs & Equipment Pads | 95% |
| 2. Paving Areas, Utility Trenches & Structures | 98% |
| 3. Landscaping | 90% |
| 4. All Other Areas | 85% |
- Recompact areas which fail to meet the compaction requirements until passing results are achieved.
- D. Compaction of utility trenches may be accomplished with a small walk behind jumping jack, until sufficient fill is in place to allow larger equipment to safely operate.
- E. Fill shall be moisture conditioned within 2 percent of optimum moisture content. Based on ASTM D-1557.

- F. After completion of compaction activities, proofroll each lift with a heavy, pneumatic tired vehicle such as a fully loaded dump truck.
1. Remove and replace soft soils.
 2. Recompact and retest area.
 3. Proofrolling shall consist of (2) two complete passes of the vehicle.

3.08 LAYOUT AND ESTABLISHMENT OF GRADES:

- A. Provide all layout and establish grades as needed for the proper execution of the work. See Paragraph 1.05 C for additional requirements.
- B. Base all layout on benchmark and lot lines provided by Owner.

3.09 GRADING AND RESHAPING SITE:

- A. Cut, fill, backfill, and rough grade as necessary to bring entire site level with elevations of undersides of concrete slabs, walks, paving and finished landscaping as indicated on Drawings or in Specifications.
- B. Grade areas to receive future topsoil to allow for such material. Leave finished surfaces and surfaces to receive paving smooth, compacted and free from irregular surface drainage.
1. For areas receiving top soil set rough grades 4" below finish grades.
 2. For areas receiving sod set finish grades 1" below final grade.
 3. For areas receiving seed set grades at finish grades
- C. Surfaces shall not vary from the established grades more than the following:
- | | |
|-----------------------|-----------|
| 1. Finished Surfaces | 0.10 feet |
| 2. Areas Under Paving | 0.05 feet |
| 3. All Other Areas | 0.05 feet |
- D. Where elevations are indicated on the Drawings obtain such finish elevations and establish uniform slopes of finish grades between indicated elevations.
- E. Where elevations are not indicated, establish and obtain uniform slope from finished spot elevations at the exterior face of the building or other vertically described site element out to the nearest indicated elevations for finished grades as shown on the Drawings.
- F. The Contractor shall provide suitable fill, as necessary, to achieve all proposed grades.
- G. In general, landscaped or grassed areas adjacent to buildings shall have finish grades set 6" below the finish floor of the structure.

3.10 SPREADING TOPSOIL:

- A. Transport topsoil from the stockpile on the site and spread uniformly on all disturbed areas that are to receive topsoil. Remove any clay, stones larger than 3/4 inch in diameter, weeds, roots, rubbish and all other foreign matter from the topsoil.
- B. Upon completion of the work, any surplus topsoil shall be removed from the project site and disposed of by the Contractor, unless otherwise directed by the owner.
- C. Any deficit in top soil shall be made up by the Contractor with an approved soil.
- D. Unless otherwise noted on the drawings restored topsoil shall be a minimum of 3" deep.

3.11 REPAIR/RESTORATION:

- A. Repair damage to other portions of the Work resulting from work of this Section at no additional cost to Owner. On new work, arrange for damage to be repaired by original installer.
- B. Disturbed areas shall be sodded or seeded and mulched as described on the Drawings or elsewhere in these specifications.

3.12 CLEAN UP:

- A. Minimize the transmission of dirt or debris by equipment or personnel to any property, public or private, outside the project Site. Immediately remove any such debris or dirt transmitted.
- B. Any excess materials left over at the conclusion of construction activities, not claimed by the Owner, shall become the property of the Contractor and shall be disposed of legally at his expense.
- C. All streets, sidewalks and paved driveways adjacent to or within the construction limits shall be swept clean of debris.

END OF SECTION

SECTION 31 20 00

SITE CLEARING, STRIPPING AND GRUBBING

PART 1 - GENERAL**1.01 DESCRIPTION OF WORK:**

- A. The General Requirements are made a part of this section as fully as if repeated herein.
- B. Work includes but is not limited to:
 - 1. Site clearing.
 - 2. Stripping and removal or stockpiling topsoil.
 - 3. Grubbing and removal of vegetation within site boundaries or within limits shown on drawings.
 - 4. Tree removal within building and paving limits and as indicated.
 - 5. Protection of existing trees to remain.
 - 6. Protection of streets, roads, adjacent property, and other facilities to remain.
 - 7. Disposal of all cleared materials.
 - 8. Disposal of all grubbed materials.

1.02 SUBMITTALS:

- A. Permit for transportation and disposal of debris.
- B. Disposal tickets from landfill.

1.03 DISPOSITION OF MATERIAL: Remove all cleared and grubbed materials from project site.

1.04 REGULATORY REQUIREMENTS:

- A. See Section 312500 (3.02. A) for FDEP NPDES Permit Requirements.

PART 2 PRODUCTS

(Not Applicable)

PART 3 - EXECUTION**3.01 CLEARING:**

- A. Limits of Clearing: As required to complete the work.
- B. Remove all trees and shrubs to ground level and grub as described below.
- C. Remove all dead trees, dead shrubs, rubbish, debris, weeds, vines and undergrowth to ground level.
- D. Remove all other obstructions resting on or protruding through surface of existing ground.
- E. Root rake entire limits of clearing. Use two (2) complete passes, one pass perpendicular to the other.
- F. Do not pull up or rip out roots of trees and shrubs that are to remain. If excavation through roots is required, excavate by hand and cut roots with fine tooth saw.

3.02 STRIPPING TOPSOIL:

- A. Strip existing vegetation layer from areas of site to receive improvements and remove from site prior to stripping topsoil for storage and reuse.
- B. After stripping vegetation layer, remove existing topsoil 6-inches deep minimum from areas of site to receive fill and store for later use. Coordinate with Owner for temporary storage location.
 - 1. Existing topsoil not otherwise claimed by Owner is property of Contractor with restriction that topsoil is to be used first for Project landscape topsoil requirements and second for fill and backfill, if suitable.
 - 2. After Project fill, backfill, and landscape topsoil requirements are satisfied, remove excess existing topsoil from site. Do not remove existing topsoil from site without Owner's prior approval.
- C. Do not include clay, stones larger than 3/4", weeds, roots, rubbish or any other foreign material in the stock piled topsoil.

3.03 GRUBBING:

- A. Remove all stumps, roots over 2 inches in diameter and matted roots to following depths:
 - 1. Footings, slabs on grade, bottom slabs of structures: 60 inches.
 - 2. Walks: 12 inches.
 - 3. Roads and parking areas: 36 inches.
 - 4. Areas to be grassed or landscaped: 8 inches.
- B. In the case of footings, slabs on grade, bottom slabs of structures, roads and parking areas, or other construction on fills, greater depth may apply.
- C. Unless further cut is required, fill depressions made by grubbing and compact to density of surrounding soil.

3.04 PROTECTION OF TREES:

- A. A visible barrier shall be constructed of 2x4 lumber standing 48" high and placed continuously 6 feet from the trunk of the tree or plant to remain.
- B. Barrier shall be secured in place and covered in safety orange netting.
- C. Barriers shall be completely removed at the conclusion of construction activities.
- D. Protect root systems from damage due to materials in solution caused by runoff or spillage during mixing and placement of construction materials or drainage from stored materials. Protect root systems from flooding, erosion or excessive wetting resulting from dewatering operations.
- E. Repair and Replacement of Trees to Remain:
 - 1. Repair trees or plants damaged by construction operations in a manner acceptable to the Engineer. Make repairs promptly after damage occurs to prevent progressive deterioration of damaged trees.
 - 2. If trees die during the course of the project or within the warranty period, the contractor shall remove them, and grind the stumps if the Owner so wishes, at no charge to the Owner.

- 3 Trees that die during construction shall be replaced with same species, Grade A and 3" DBH. Trees shall be furnished and planted by the contractor at no cost to the Owner.

3.05 CLEAN-UP:

- A. Remove from site trees, shrubs, uprooted stumps, vegetative layer, and surface debris. All material shall be disposed of legally.
- B. Remove and dispose of all stockpiled topsoil not claimed by Owner.
- C. Do not bury cuttings, stumps, roots, and other vegetative matter or burn waste material on site.
- D. Clean pavement, sidewalks and drainage features of debris and dirt.

END OF SECTION

SECTION 31 23 19

DEWATERING

PART 1 - GENERAL

- 1.01 RELATED DOCUMENTS:** The General Provisions of the Contract, including the General Conditions, Supplementary Conditions and Special Conditions (if any), along with the General Requirements, apply to the work specified in this Section.
- 1.02 DESCRIPTION:** The Work to be performed under this section shall include furnishing all equipment and labor necessary to remove storm or subsurface waters from excavation areas in accordance with the requirements set forth and as shown on the drawings.
- 1.03 APPLICABLE CODES, STANDARDS AND SPECIFICATIONS:** The dewatering of any excavation areas and the disposal of the water shall be in strict accordance with the latest revision of all local and state government rules and regulations. The Contractor shall obtain any required dewatering permit from the appropriate agencies prior to commencing dewatering operations.
- 1.04 SUBMITTALS:** Prior to the start of construction the Contractor shall provide to the Owner a dewatering plan describing the surfacewater and groundwater control methods which will be employed to control water levels in excavations so that construction is not inhibited.
- A. Plan shall include temporary culverts, barricades and other protective measures to prevent damage to property or injury to any person or persons.
 - B. Plan shall indicate disposal method and location of point discharge.
 - C. Proof of Compliance with Florida Department of Environmental Protection Rule 62-621.300(2), if applicable. See Paragraph 3.02 (B).

PART 2 - PRODUCTS

(Not Applicable)

PART 3 - EXECUTION

3.01 PERFORMANCE:

A. General:

1. The Contractor shall provide adequate equipment for the removal of storm or subsurface waters which may accumulate in any excavation.
2. The Contractor shall maintain groundwater levels as follows:
 - a. 2 feet (24") below foundation bearing elevation.
 - b. 2 feet (24") below pavement base bearing elevation.
 - c. 1 foot (12") below bottom of utility pipes and structures.
 - d. Bottom of trench or other excavation shall be dry so that work can proceed.
3. System shall intercept water on all sides of area to be drawn down.
4. Contractor shall adhere to approved Dewatering Plan.
5. Engines driving any proposed dewatering pumps shall be equipped with residential type mufflers.

B. Acceptable Methods:

1. Wellpoint System
2. Trench and Sock Drain
 - a. Dewatering by trench pumping will not be permitted if migration of fine grained natural material from bottom, side walls or bedding material will occur.
3. Trench and Barrel Sump

3.02 DISPOSAL:

A. General:

1. Water pumped from an excavation shall be disposed (in strict compliance with all Local, State and Federal Regulations) of in the following:

- a. Site Stormwater Pond or other Stormwater Facility serving the project.
 - b. Temporary disposal pit or trench.
2. Direct discharge to waters of the state or other surface waters is strictly prohibited without prior written approval from the governing agency.
 3. No flooding of streets, roadways, driveways or private property shall be permitted.

B. Regulatory Requirements:

1. Contractor is responsible for acquiring and complying with all permits and approvals necessary to perform the dewatering activity.
 - a. The Florida Department of Environmental Protection requires testing of groundwater prior to dewatering (F.A.C. 62-621.300(2))for each point source that discharges to waters of the State.
2. All waterways shall be protected from turbidity during the dewatering operation.

3.03 RESTORATION:

- A. All temporary drains, pipe or other non-soil materials shall be removed at the conclusion of the dewatering activity.
- B. Soils disturbed by the removal process shall be compacted and stabilized as required by Section 310000.

END OF SECTION

SECTION 31 25 00

EROSION AND SEDIMENTATION CONTROL

PART 1 - GENERAL

1.01 RELATED DOCUMENTS: The General Provisions of the contract, including the General Conditions, Supplementary Conditions and Special Conditions, along with the General Requirements, apply to the work specified in this Section.

1.02 SUMMARY:

- A. Includes But Not Limited To: Provide, install, maintain, and remove erosion and sedimentation controls as described in Contract Documents and as required by Contractors Pollution Prevention Plan.
- B. Related Sections:
 - 1. Section 310000 - Earthwork
 - 2. Section 312319 - Dewatering
 - 3. Section 312000 - Site Clearing

1.03 REFERENCES:

- A. Florida Department of Transportation (Latest Editions):
 - 1. Standard Specification for Road & Bridge Construction.
 - 2. Design Standards for Design, Construction, Maintenance and Utility Operations on the State Highway System.
- B. Florida Department of Environmental Protection:
 - 1. Rule 62-621 Generic Permits.
 - 2. Florida Development Manual: A Guide to Sound Land and Water Management.

1.04 SUBMITTALS:

- A. Provide copy of application and stormwater pollution prevention plan as submitted to Florida Department of Environmental Protection as required by 312500 (3.02 A).

- B. Provide a copy of Notice of Termination (NOT) of coverage under FDEP Generic Permit for Large and Small Construction Activities.

PART 2 - PRODUCTS

2.01 MATERIALS:

- A. Filter Fabric: Florida Department of Transportation Class D-3 material.
- B. Sand Cement Bags:
1. Portland Cement: ASTM C-150 Type I/II material.
 2. Fine Aggregate: Clean silica sand or other inert natural material of similar characteristics.
 - a. 97% material passing No.4 sieve
 - b. 20% material passing No.100 sieve
 - c. 5% material passing No. 200 sieve
 3. Sacks: Provide sacks of uniform size made of jute, cotton or scrim reinforced paper capable of holding the sand cement mixture without leakage. Sacks shall provide a finished unit approximately 12x18x6 inches in measurement. Material shall be permeable and absorptive enough to permit passage of water to provide for hydration of cement. Materials shall be biodegradable and contain no asphalt, oil or plastic lamination.
- C. Fiber Rolls:
1. Tube shaped rolls of straw, flax, rice, coconut fiber, or compost.
 2. Rolls shall be wrapped with UV degradable polypropylene netting or biodegradable netting.
- E. Silt Fence:
1. Florida Department of Transportation Type III silt fence meeting all requirements of FDOT Index 103.
- F. Seed for Temporary Erosion Control:
1. Winter Months (October to March): Annual Rye Grass

2. Summer Months (April to September): Millet Grass

PART 3 - EXECUTION

3.01 PERFORMANCE:

A. General:

1. Provide and maintain temporary erosion and sedimentation control measures from time site is disturbed to time permanent controls, paving, landscaping, and site restoration measures are able to perform erosion and sedimentation control functions.
2. Clean-out, repair, and maintain control structures as necessary to enable them to perform properly.
3. Prevent pollution of streams, water impoundments, and channels leading to them with chemicals, fuels, lubricants, bitumens, raw sewage, and other harmful waste.

B. Sediment Barriers/Silt Fence:

1. Place fence as shown on Drawings and as necessary to maintain regulatory compliance with Contractor's Pollution Prevention Plan.
2. As a minimum, Silt Fence shall be installed along all downstream project property lines and between any construction activity and all waterways, water bodies, sewer inlets and wetlands.

C. Fiber Rolls:

1. Place fiber rolls as shown on Drawings and as necessary to maintain regulatory compliance with Contractor's Pollution Prevention Plan.

D. Seed or Sod:

1. All areas disturbed by construction, and to remain unpaved or outside the building envelope, shall be stabilized by permanent seed and mulch or sod, as described elsewhere in the contract documents. Refer to Section 329200 for permanent grassing requirements.
2. Areas that will be regraded or otherwise disturbed later during construction may be seeded with a temporary seed mix to obtain temporary erosion control.

E. Sand-cement Bag Rip Rap:

1. Proportion sand and cement in the ratio of 5 cubic feet of sand to 94 lbs of cement.
2. Fill sacks to uniform size. Keep at least 6 inches of the sacks unfilled to allow for tying and closure.
3. Place sacks as shown on the drawings. Place sacks in a running bond type pattern. Align sacks/bags so that continuous joints are perpendicular to the primary flow and staggered joints are parallel to the primary flow.
4. Stake alternating bags in place with an 18" length of #3 rebar centered in bag. Set top of bar 1" below surface of bag.
5. After placement saturate bags with water.

3.02 REGULATORY REQUIREMENTS:

A. Florida Department of Environmental Protection (FDEP) - NPDES Program:

1. Contractor shall notify Florida Department of Environmental Protection of proposed construction and file Notice of Intent (NOI) to use Generic Permit for Stormwater Discharge from Large and Small Construction Activities with Florida Department of Environmental Protection.
2. Contractor shall be responsible for application fee and preparation of all attachments. Attachments shall include a Pollution Prevention Plan.
 - a. The minimum requirements for pollution prevention are described on the contract drawings and in these specifications.
 - b. The Contractor may use the pollution controls presented in these documents as the basis for his Pollution Prevention Plan.
 - c. The Contractor shall supplement the contract drawings and specifications as necessary to satisfy the Contractor's permit application and the Contractor's means and methods of construction.
3. It shall be the Contractor's responsibility to familiarize himself with the permit conditions and maintain the site in a condition that will be compliant with the permit.

4. Any testing or other requirements required by the governing agency to remain compliant or in response to a non-compliance event shall be the financial and material burden of the Contractor.
5. Contractor shall notify FDEP of conclusion of project and submit a notice of termination (NOT) coverage.

3.03 REPAIR AND RESTORATION:

- A. If any seed is washed out before germination , repair damage, refertilize and reseed.
- B. Maintain silt fence in a functional condition. Repair any damage immediately. Implement a routine maintenance schedule for all erosion schedule. All erosion control features shall be inspected immediately following all storm events.

3.04 CLEANING:

- A. Remove temporary controls and accumulated sediments when permanent facilities are able to perform function and when approved by Engineer.
- B. Remove accumulations of silt and other erosion products from all permanent facilities.

END OF SECTION

SECTION 31 31 16

TERMITE CONTROL

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Termicide treatment for subterranean termite control.
- B. Chemical soil treatment.

1.02 SUBMITTALS

- A. See Section 01 30 00 - Administrative Requirements, for submittal procedures.
- B. Product Data: Indicate termiticide toxicants to be used, composition by percentage, dilution schedule, intended application rate.
- C. Manufacturer's Application Instructions: Indicate caution requirements and application procedures.
- D. Manufacturer's Certificate: Certify that termiticide toxicants meet or exceed specified requirements.
- E. Warranty: Submit warranty and ensure that forms have been completed in City of Fernandina Beach, Florida's name.

1.03 QUALITY ASSURANCE

- A. Installer Qualifications: Company specializing in performing this type of work and:
 1. Having minimum of 2 years documented experience.
 2. Approved by manufacturer of treatment materials.
 3. Licensed in Fernandina Beach, Florida.

1.04 REGULATORY REQUIREMENTS

- A. Conform to applicable code for requirements for application, and comply with EPA regulations.
- B. Provide certificate of compliance from The State of Florida FBC Section 1816 Termite Protection Specification standards indicating approval of toxicants.

1.05 SEQUENCING

- A. Apply toxicant immediately prior to installation of vapor barrier under slabs-on-grade.

1.06 WARRANTY

- A. See Section 01 78 00 - Closeout Submittals, for additional warranty requirements.
- B. Provide five year installer's warranty against damage to building caused by termites.
 1. Include coverage for repairs to building and to contents damaged due to building damage. Repair damage and, if required, re-treat.
 2. Warranty: Include coverage for damage and repairs to building and building contents caused by termites. Repair damage. Re-treat where required. Warrantee shall provide for up to \$25,000 for repair of each damaged building.
 3. Inspect annually and report in writing to City of Fernandina Beach, Florida. Provide inspection service for five years from Date of Substantial Completion. Provide a renewal option at a given price for an additional five years.

PART 2 PRODUCTS

2.01 MATERIALS

- A. Manufacturers:
 - 1. BSAF Corporation: Produce Termidor 80 WG Termiticide/insecticide.
 - 2. Gharda Corporation: Product Navagator 4TC.
 - 3. Substitutions: See Section 01 60 00 - Product Requirements.
- B. Toxicant Chemical: EPA approved; synthetically color dyed to permit visual identification of treated soil.
- C. Diluent: Recommended by toxicant manufacturer.

2.02 MIXES

- A. Mix toxicant to manufacturer's instructions.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Verify that soil surfaces are sufficiently dry to absorb toxicant, and ready to receive treatment.
- B. Verify final grading is complete.

3.02 APPLICATION

- A. Comply with requirements of U.S. EPA and applicable state and local codes.
- B. Spray apply toxicant in accordance with manufacturer's instructions.
- C. Apply toxicant at following locations:
 - 1. Under Slabs-on-Grade.
 - 2. At Both Sides of Foundation Surface.
 - 3. Soil Within 10 feet of Building Perimeter For a Depth of 2 feet.
- D. Under slabs, apply toxicant immediately prior to installation of vapor barrier.
- E. At foundation walls, apply toxicant immediately prior to finish grading work outside foundations.
- F. Apply extra treatment to structure penetration surfaces such as pipe or ducts, and soil penetrations such as grounding rods or posts.
- G. Re-treat disturbed treated soil with same toxicant as original treatment.
- H. If inspection or testing identifies the presence of termites, re-treat soil and re-test.

3.03 PROTECTION

- A. Do not permit soil grading over treated work.

END OF SECTION

SECTION 32 12 16

ASPHALTIC CONCRETE PAVING

PART 1 - GENERAL

1.01 DESCRIPTION OF WORK: The extent of asphaltic concrete paving work is shown on the drawings.

1.02 SUBMITTALS:

- A. Material Certificates: Provide copies of material certificates including design mixes, signed by the Contractor, certifying that each specified material complies with, or exceeds requirements.
- B. Copies of all compliance testing and retests.

1.03 JOB CONDITIONS:

- A. Weather Limitations: Apply prime and tack coats only when ambient temperature is above 50 degrees F and when temperature has not been below 35 degrees F for 12 hours immediately prior to application. Do not apply when base contains an excess of moisture.
- B. Construct asphalt concrete surface only when atmospheric temperature is above 50 degrees F and when base is dry. Base course may be placed when air temperature is above 30 degrees F and rising.
- C. Do not lay base or asphalt when free surface water is present on the material below.

1.04 RELATED DOCUMENTS: The General Requirements of the Contract, including the General Conditions, Supplementary Conditions, and Special Conditions (if any), along with the General Requirements, apply to the work specified in this Section.

1.05 REFERENCES:

- A. American Society For Testing And Materials (ASTM):
 - 1. ASTM C131-96, 'Standard Test Method for Resistance to Degradation of Small-Size Coarse Aggregate by Abrasion and Impact in the Los Angeles Machine.'
 - 2. ASTM D 977-98, 'Standard Specification for Emulsified Asphalt.'
 - 3. ASTM D 1075-96 (2000), 'Standard Test Method for the Effect of Water on Compressive Strength of Compacted Bituminous Mixtures.'

4. ASTM D 1188-96, 'Standard Test Method for Bulk Specific Gravity and Density of Compacted Bituminous Mixtures Using Paraffin-Coated Specimens.'
 5. ASTM D 1559-89, 'Standard Test Method for Resistance to Plastic Flow of Bituminous Mixtures Using Marshall Apparatus.'
 6. ASTM D 2027-97, 'Standard Specification for Cutback Asphalt (Medium-Curing Type).'
 7. ASTM D 2041-00, 'Standard Test Method for Theoretical Maximum Specific Gravity and Density of Bituminous Paving Mixtures.'
 8. ASTM D 2397-98, 'Standard Specification for Cationic-Emulsified Asphalt.'
 9. ASTM D 2726-00, 'Standard Test Method for Bulk Specific Gravity and Density of Compacted Bituminous Mixtures Using Saturated Surface-Dry Specimens.'
 10. ASTM D 3381-92 (1999), 'Standard Specification for Viscosity-Graded Asphalt Cement for Use in Pavement Construction.'
- B. Florida Department of Transportation (FDOT):
1. FDOT 'Standard Specifications for Road and Bridge Construction.'
 2. FM - 5 - 515 'Florida Method of Test for Limerock Bearing Ratio'.

PART 2 - PRODUCTS

2.01 MATERIAL:

- A. Subgrade: All roadway stabilized subgrade, as required shall comply with Section 160, of FDOT Standard Specifications for Type 'B' stabilization.
- B. Base Course: Graded Aggregate Base - Material shall be as specified in Section 204, Graded Aggregate Base, of the Standard FDOT Specifications.
- C. Asphaltic Concrete Pavement: Asphalt pavement shall be Superpave (SP). However, the wear course shall be SP 12.5 (Fine) or SP-9.5 (fine) only. Materials shall conform to the following: Section 334, Superpave Asphalt Concrete; Section 901, Coarse Aggregate; Section 902, Fine Aggregate; Section 916, Bituminous Material; and Section 917, Mineral Filler of the FDOT Standard Specifications for Road and Bridge Construction (Latest Edition).
- D. Priming: Prime coat shall be emulsified asphalt of a grade applicable to the base used meeting the requirements of Section 916, Bituminous Material of the FDOT Standard Specifications. Cover material for prime coat shall be hot asphalt coated sand meeting the requirements of Section 902, Fine Aggregate of the FDOT Standard Specifications.

- E. Tack Coat: Use RA-500 material meeting the requirements of section 916-2 of FDOT Standard Specifications.
- F. Pavement Paints: Marking and striping shall utilize traffic paint meeting or exceeding requirements as specified below.
 - 1. Where indicated on the drawings, Thermoplastic Pavement Marking materials shall comply with the following: Section 971-1, General Requirements; Section 971-17, Thermoplastic Materials for Traffic Stripes of the FDOT Standard Specifications.
 - 2. Where indicated on the drawings, Painted Striping materials shall comply with the following: Section 971-1, General Requirements; Section 971-12, Two Reactive Component Materials For Traffic Stripes And Marking, or Section 971-13, Fast Dry Solvent Traffic Paint; and Section 971-14, Glass Spheres of the FDOT Standard Specifications.
 - a. Parking stall striping shall be non reflective.
- G. Raised Pavement Markers: Shall be FDOT Type 911-4"x4"
- H. Pre-emergent Herbicide:
 - 1. Selective type pre-emergence control chemical suitable for use under pavement.
 - 2. Application personnel shall be certified in the state of Florida for application of agricultural chemicals.

PART 3 - EXECUTION

3.01 INSTALLATION:

- A. Survey and stake surfaces to show grading required by Contract Documents.
 - 1. Use a Florida Registered Professional Land Surveyor to provide all horizontal and vertical layout.
- B. Subgrade: Unless otherwise noted subgrade shall be a minimum of twelve (12) inch deep. Constructed stabilized subgrade shall be mixed, moisture conditioned and compacted to 98% of the maximum density (ASTM D 1557). Prepared material shall provide a limerock bearing ratio (LBR) of 40. The subgrade shall be constructed as specified in Section 160, Stabilizing of the FDOT Standard Specifications for Road & Bridge Construction (Latest Edition).

1. Fine grade surface area to accommodate finish grades required by Contract Documents.
2. Prepared surface shall be proof-rolled with a heavy pneumatic tired vehicle.
 - a. Proof-roll entire surface area a minimum of two passes in each direction
 - b. Remove material from soft areas and replace with new material. Failing areas shall be reconstructed to the full depth of the material. If necessary, additional stabilizing material shall be added. Recompact and retest.
3. Plasticity index shall not exceed 8 and liquid limit shall not exceed 30 in prepared material.

C. Pre-emergent Herbicide:

1. Apply to prepared subgrade dispersed in liquid. Concentrate shall be such that Manufacturer's full recommended rate of chemical will be applied to every 1000 sq ft and liquid will penetrate a minimum of 2 inches.
2. Application shall be no more than one day before installation of base.
3. Take necessary precautions to protect adjoining property and areas designated for planting on building site.

D. Graded Aggregate (Crushed Concrete) Base Course: Graded Aggregate shall be moisture conditioned and compacted to achieve an LBR of 100 and 98% of maximum density as determined by the modified proctor (ASTM D 1557). Thickness shall be as shown on the drawings. Base shall be constructed as specified in Section 200, Rock Base of FDOT Standard Specifications.

1. Surface shall be uniform and free of birdbaths.
2. Surface variations in prepared base material shall not exceed 1/4" when measured with a 12' straight edge.

E. Asphaltic Concrete Pavement: Thickness and Type shall be as shown on the drawings and shall be constructed as specified in Section 320, Hot Bituminous Mixtures-Plant, Methods, and Equipment; Section 330, Hot Bituminous Mixtures-Quality Assurance, General Construction Requirements and Acceptance Procedures; and Section 334, Superpave Asphaltic

Concrete of the FDOT Standard Specifications for Road and Bridge Construction (Latest Edition).

1. Wear course shall be Type SP-12.5 (Fine) or SP-9.5 (fine) only.
 2. Surface shall be uniform and free of birdbaths.
 3. Surface variations in wear surface shall not exceed 1/4" when measured with a 12' straight edge.
 4. Spreading:
 - a. Spread material in a manner that requires the least handling.
 - b. Where thickness of finished paving will be 3" or less, spread in one layer.
 5. Rolling:
 - a. After the material has been spread to the proper depth, roll until the surface is hard, smooth, unyielding, and true to the thickness and elevations shown on the drawings.
 - b. Roll in at least two directions until no roller marks are visible.
- F. Priming: All base material shall be primed. Prime coat shall be applied in accordance with Section 300, Prime and Tack Coats For Base Courses of the FDOT Standard Specifications. Cover material for prime coat shall be applied with approved distributor.
- G. Tack Coat: All base material and any concrete surfaces that will be in contact with the asphalt course shall receive a tack coat. Tack coat shall be applied in accordance with Section 300 Prime and Tack Coats For Base Courses of the FDOT Standard Specifications.
- H. Pavement Paints: Pavement Marking and striping shall be applied in accordance with Section 709, Traffic Stripes and Markings-Two Reactive Components; Section 710, Painting Traffic Stripes; and Section 711, Thermoplastic Traffic Stripes and Markings of the FDOT Standard Specifications for Road and Bridge Construction (Latest Edition). Type and location of marking to be used shall be as described on the Drawings.
- I. Paving shall not proceed if subgrade and base are too wet or too dry. Subgrade and Base materials shall be within their respective acceptable range of optimum moisture content. Moisture content shall be measured a maximum of 2 hours prior to paving operations.

3.02 ASPHALT OVERLAY:

- A. Existing asphalt surface to receive overlay shall be mechanically swept and cleaned of loose material.
- B. Cracks over 1/4 inch in width shall be filled with a hot mix asphalt sealant.
- C. Existing asphalt exposed concrete to be in contact with new asphalt shall receive a tack coat.
- D. Exposed base shall be primed and asphalt surface patched to match surrounding grade.
- E. Where localized depressions occur that exceed 1/2" in depth. The asphalt shall be sawcut, removed and the base replaced for its full depth. The asphalt surface shall be patched to match the surrounding grade prior to installation of final overlay.
- F. Asphalt shall be spread and rolled as described in paragraph 3.01 of this section.
- G. The limits of existing asphalt perpendicular to any travel lane shall be milled or the asphalt sawcut and removed to allow a flush connection between the overlay and the existing asphalt beyond.

3.03 FIELD QUALITY CONTROL:

- A. All work shall meet the requirements of the FDOT.
- B. Surface of completed work shall not contain irregularities greater than 1/4" when checked with a 12 foot straight edge.

3.04 TESTING:

- A. Stabilized subgrade material tests shall be made as follows:
 - 1. Determine optimum moisture/density relationship of stabilized subgrade material in accordance with ASTM D1557. Verify moisture content of in-place material (ASTM D2216) is within 4% ± of optimum.
 - 2. Perform in-place density tests (ASTM D1557) in the compacted stabilized subgrade material at the rate of one test for every 3,000 sf or fraction thereof. Recompact areas which fail to meet compaction requirements, then retest until passing results are obtained. Reference test locations to easily identified points on Site Plan.

3. Contractor shall perform bearing value tests on samples of in-place material by the Limerock Bearing Ratio (LBR) Method. One (1) test shall be performed for each 3,000 SF, or fraction thereof. For areas failing to meet the minimum LBR, additional stabilizing material shall be spread, mixed and retested until satisfactory results are obtained.

B. Base material tests shall be made as follows:

1. Determine optimum moisture/density relationship of base material in accordance with ASTM D1557. Verify moisture content of in-place material (ASTM D2216) is within 2% (\pm) of optimum. Moisture content shall be verified a within 24 hours prior to paving operations
2. Perform in-place density tests in the compacted base material at the rate of one test for every 3,000 sf or fraction thereof. Recompact areas which fail to meet compaction requirements, then retest until passing results are obtained. Reference test locations to easily identified points on Site Plan.
3. Contractor shall perform bearing value tests on samples of in-place material by the Limerock Bearing Ratio (LBR) Method. One (1) test shall be performed for each 3,000 SF, or fraction thereof.
4. Base material shall be cored for thickness at the rate of one test for each 3,000 sf of surface area. Passing tests shall be within $\frac{1}{2}$ " of specified thickness. Where material fails to meet the required thickness existing material shall be removed and subgrade cut down to accept additional material as required. Area shall be recompact and retested as required by item 3.04(B)2 above.

C. Asphalt tests shall be made as follows:

1. At the start of paving operations, obtain one sample each of binder (if specified) and wearing surface asphalt delivered to the job. Conduct extraction and gradation analysis, Marshall Stability, and laboratory-compacted bulk specific gravity for each sample.
2. Upon completion of paving, obtain at least two 4-inch diameter cores through the asphalt paving for all areas up to 3,000 sq. feet and one additional core for each additional 3,000 sq. feet or fraction thereof. Grout core holes with non-shrink grout after core removal. Reference test locations to easily identified points on the Site Plan.
3. Measure each asphalt core for thickness and test for bulk specific gravity. Compute the compaction percentage of each core, using the bulk specific gravity of the laboratory compacted specimen as the compaction standard.

EXHIBIT "A"

- D. Copies of all testing shall be provided to the Owner and Engineer directly from the testing laboratory.
- E. All testing, retesting and remedial work shall be at the Contractor's expense.
- F. Failing results for any of the testing above shall be cause for rejection of all or part of the work performed. Contractor shall reconstruct deficient work at no additional cost to the owner.

END OF SECTION

SECTION 32 13 00

SITE CONCRETE

PART 1 - GENERAL

- 1.01 RELATED DOCUMENTS:** The General Provisions of the contract, including the General Conditions, Supplementary Conditions and Special Conditions, along with the General Requirements, apply to the work specified in this Section.
- 1.02 REFERENCES:** All work shall be in accordance with Section 522 Concrete Sidewalk, Section 350 Cement Concrete Pavement, and Section 520 Concrete Gutter & Curb Elements of the latest edition of the "Florida Department of Transportation Standard Specifications for Road and Bridge Construction" unless specifically stated or directed otherwise.
- 1.03 SUBMITTALS:**
- A. Material Certificates: Provide copies of material certificates including design mixes, signed by the Contractor, certifying that each specified material complies with, or exceeds requirements.
 - B. Copies of all compliance testing and retests.
- 1.04 QUALITY ASSURANCE:**
- A. Perform the Work of this section in accordance with ACI 301 and ACI 318.
 - B. Follow recommendations of ACI 305 when concreting during hot weather.
 - C. Follow recommendations of ACI 306 when concreting during cold weather.

PART 2 - PRODUCTS**2.01 CONCRETE MIX, DESIGN AND TESTING:**

- A. Comply with requirements of applicable FDOT Section 346 for Class I concrete mix design, sampling and testing, and quality control, and as herein specified.
- B. Design the mix to produce standard weight concrete consisting of portland cement, aggregate, air-entraining admixture and water to produce the following properties.

1. Compressive Strength:
 - a. Sidewalks: 3,000 psi @ 28 days
 - b. Pavement: 4,000 psi @ 28 days
 - c. Curb: 3,000 psi @ 28 days
 2. Air Content: 3% to 6%
 3. Fly Ash Content: Maximum 25 percent of cementitious materials by weight.
 4. Silica Fume and Calcined Pozzolan Content: Not Allowed.
 5. Water-Cement Ratio: Maximum 0.5 percent by weight.
 6. Maximum Aggregate Size: 3/4-inch
 7. Slag Content: Maximum 50 percent of cementitious materials by weight.
 8. Portland Cement: Type I or II, not less than 50% of total cementitious material by weight.
- C. Concrete placement slump shall not exceed plus or minus 1-inch from approved design slump.

2.02 JOINT DEVICES AND MATERIALS:

- A. Joint Filler: Nonextruding, resilient asphalt impregnated fiberboard, felt, or cork, complying with ASTM D 1751, thickness as indicated on drawings and width/depth as indicated.
- B. Construction Joint Devices: Integral galvanized steel; formed to tongue and groove profile, with removable top strip exposing sealant trough, knockout holes spaced at 6 inches, ribbed steel spikes with tongue to fit top screed edge.

2.03 REINFORCING MATERIALS:

- A. Welded Wire Fabric: ASTM A185, welded steel wire fabric, 65 ksi, flat sheets only.
- B. Reinforcing Bars: ASTM A615, Grade 60 deformed billet steel bars.
- C. Supports: Provide chairs, bolsters, spacers and other devices as necessary to properly position and support the reinforcing during the concrete pour.

PART 3 - EXECUTION**3.01 CONCRETE SIDEWALK & PAVEMENT INSTALLATION:**

- A. General: Sidewalk, Curb and Pavement shall be installed where indicated on the drawings. Width of surface shall be as called out on the drawings.
1. All non-canopy sidewalk shall be a minimum of 4-inches thick and unreinforced.
 2. All sidewalk at driveways or other areas subject to vehicular traffic shall be 6-inches thick with 6x6, W1.4xW1.4 welded wire mesh reinforcement. The length of 6-inch thick sidewalk shall extend 10' each side of entrance drives.
 3. All pavement shall be thickness described on drawings.
- B. Surface Preparation:
1. Construct stabilized sub-grade within limits of proposed sidewalk or pavement and level with the underside of concrete. Stabilization material and procedures shall be as described in the FDOT Standard Specifications for Road and Bridge Construction.
 - a. Sidewalks: None Required.
 - b. Pavement and Curb: Construct 12" thick stabilized subgrade.
 2. Proof-roll prepared sub-grade surface to check for unstable areas and the need for additional compaction.
 3. Remove loose material from the compacted sub-grade surface immediately before placing the concrete.
 4. Sub-grade for sidewalks shall be compacted to a minimum of 98 percent of AASHTO T-180 density and achieve an LBR value of 40. Density tests shall be required for every 300 LF of sidewalk installed, at a minimum. Where failing density tests occur, Contractor shall be required to recompact and retest area in both directions from point of failure to insure proper compaction has been achieved.
 5. Subgrade preparation and construction for a concrete pavement section shall be subject to the subgrade requirements described in Section 32 12 16 Asphaltic Concrete Paving including all testing requirements.

C. Concrete Placement:

1. Do not place concrete until sub-base and forms have been checked for line and grade. Moisten if required to provide a uniform dampened condition at the time concrete is placed. Do not place concrete around meter boxes or other structures until they are completed to required finish elevation and alignment.
2. Place concrete using methods which prevent segregation of the mix. Consolidate concrete along the 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 dislocation of reinforcing, dowels and joint devices. Do not use vibrators to push or move concrete in forms or chute.
3. Deposit and spread concrete in a continuous operation between transverse joints as far as possible. If interrupted for more than $\frac{1}{2}$ hour place a construction joint.
4. Joints: Construct expansion, weakened-plane (contraction), and construction joints true-to-line with face perpendicular to surface of the concrete, unless otherwise indicated. Construct transverse joints at right angles to the centerline, unless otherwise indicated. When joining existing structures, place transverse joints to align with previously placed joints, unless otherwise indicated.
 - a. Weakened-Plane Joints: Construct weakened-plane joints for a depth equal to at least 1 $\frac{1}{4}$ -inch thickness or $\frac{1}{4}$ the pavement thickness whichever is greater, by sawing within six to eight hours of placement or formed during finishing operations. Place joints as described on drawings.
 - b. Construction Joints: Place construction joints at the end of all pours and at locations where placement operations are stopped for a period of more than $\frac{1}{2}$ hour, except where such pours terminate at expansion joints. Construction joints shall be standard metal keyway-section form of appropriate height.
 - c. Tooled Joints: Where weakened plane joints cross a continuous footing the joints shall be tooled instead of sawcut. The depth of concrete at the joint shall not be less than 6-inches.

PART 3 - EXECUTION**3.01 CONCRETE SIDEWALK & PAVEMENT INSTALLATION:**

- A. General: Sidewalk, Curb and Pavement shall be installed where indicated on the drawings. Width of surface shall be as called out on the drawings.
1. All non-canopy sidewalk shall be a minimum of 4-inches thick and unreinforced.
 2. All sidewalk at driveways or other areas subject to vehicular traffic shall be 6-inches thick with 6x6, W1.4xW1.4 welded wire mesh reinforcement. The length of 6-inch thick sidewalk shall extend 10' each side of entrance drives.
 3. All pavement shall be thickness described on drawings.
- B. Surface Preparation:
1. Construct stabilized sub-grade within limits of proposed sidewalk or pavement and level with the underside of concrete. Stabilization material and procedures shall be as described in the FDOT Standard Specifications for Road and Bridge Construction.
 - a. Sidewalks: None Required.
 - b. Pavement and Curb: Construct 12" thick stabilized subgrade.
 2. Proof-roll prepared sub-grade surface to check for unstable areas and the need for additional compaction.
 3. Remove loose material from the compacted sub-grade surface immediately before placing the concrete.
 4. Sub-grade for sidewalks shall be compacted to a minimum of 98 percent of AASHTO T-180 density and achieve an LBR value of 40. Density tests shall be required for every 300 LF of sidewalk installed, at a minimum. Where failing density tests occur, Contractor shall be required to recompact and retest area in both directions from point of failure to insure proper compaction has been achieved.
 5. Subgrade preparation and construction for a concrete pavement section shall be subject to the subgrade requirements described in Section 32 12 16 Asphaltic Concrete Paving including all testing requirements.

C. Concrete Placement:

1. Do not place concrete until sub-base and forms have been checked for line and grade. Moisten if required to provide a uniform dampened condition at the time concrete is placed. Do not place concrete around meter boxes or other structures until they are completed to required finish elevation and alignment.
2. Place concrete using methods which prevent segregation of the mix. Consolidate concrete along the 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 dislocation of reinforcing, dowels and joint devices. Do not use vibrators to push or move concrete in forms or chute.
3. Deposit and spread concrete in a continuous operation between transverse joints as far as possible. If interrupted for more than ½ hour place a construction joint.
4. Joints: Construct expansion, weakened-plane (contraction), and construction joints true-to-line with face perpendicular to surface of the concrete, unless otherwise indicated. Construct transverse joints at right angles to the centerline, unless otherwise indicated. When joining existing structures, place transverse joints to align with previously placed joints, unless otherwise indicated.
 - a. Weakened-Plane Joints: Construct weakened-plane joints for a depth equal to at least 1 1/4-inch thickness or 1/4 the pavement thickness whichever is greater, by sawing within six to eight hours of placement or formed during finishing operations. Place joints as described on drawings.
 - b. Construction Joints: Place construction joints at the end of all pours and at locations where placement operations are stopped for a period of more than ½ hour, except where such pours terminate at expansion joints. Construction joints shall be standard metal keyway-section form of appropriate height.
 - c. Tooled Joints: Where weakened plane joints cross a continuous footing the joints shall be tooled instead of sawcut. The depth of concrete at the joint shall not be less than 6-inches.

d. Expansion Joints:

- (1) Provide premolded joint filler for expansion joints abutting concrete curbs, catch basins, manholes, inlets, structures, walks and other fixed objects, unless otherwise indicated.
- (2) Locate expansion joints as described on the drawings.
- (3) Extend joint fillers full-width and depth of joint, and not less than $\frac{1}{2}$ " below finished surface where joint sealer is indicated. If no joint sealer, place top of joint filler flush with finished concrete surface.
- (4) Furnish joint fillers in one-piece lengths for the full width being placed, wherever possible. Where more than one length is required, lace or clip joint filler sections together. Pieces shorter than 4' shall not be used unless specifically shown as such.
- (5) Protect the top edge of the joint filler during concrete placement with a metal cap or other temporary material. Remove protection after concrete has been placed on both sides of joint.
- (6) Fillers and Sealants: Comply with the requirements of these specifications for preparation of joints, materials installation, and performance and as herein specified.

D. Concrete Finishing:

1. After striking-off and consolidating concrete, smooth the surface by screeding and floating. Use hand methods only where mechanical floating is not possible. Adjust the floating to compact the surface and produce a uniform texture.
2. Unless under canopy, all sidewalk surfaces shall be cross sloped (1.0%) to provide positive drainage towards curbing or grassed area.
3. All pavement surfaces shall be sloped to grades shown on the drawings.
4. After floating, test surface for trueness with a 20' straightedge. Variations exceeding $\frac{1}{4}$ " for any two points within 10' shall not be acceptable. Distribute concrete as required to remove surface irregularities, and refloat repaired areas to provide a continuous smooth finish.

5. Work edges of slabs, gutters, back top edge of curb, and formed joints with an edging tool, and round 10 ½" radius, unless otherwise indicated. Eliminate any tool marks on concrete surface.
 6. After completion of floating and when excess moisture or surface sheen has disappeared, broom finish surface by drawing a fine-hair broom across concrete surface, perpendicular to the line of traffic.
 7. Do not remove forms for 24 hours after concrete has been placed. After form removal, clean up ends of joints and point-up any minor honeycombed areas.
- E. Curing: Protect and cure finished concrete paving and walks, as required. Use moist-curing methods for initial curing whenever possible or approved concrete curing compounds.
- F. Repairs and Protections:
1. Repair or replace broken or defective concrete as directed by the Engineer.
 2. Drill test cores where directed by the Engineer, 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 resin grout.
 3. Protect concrete from damage until acceptance of work. When construction traffic is permitted, maintain pavement as clean as possible by removing surface stains and spillage of materials as they occur.
 4. Sweep concrete pavement and wash free of stains and discolorations, dirt and other foreign material just prior to final inspection.

3.02 FIELD QUALITY CONTROL:

- A. Perform one set of test cylinders for every 50 yards of concrete poured per day or fraction thereof. Sampling and testing shall be in accordance with ASTM C39 and ASTM C31.
- B. Two concrete test cylinders are to be broken at 28 days and the average value used as the test result. FBC 1905.6.1.4.
- C. Provide for concrete cylinder testing, which shall include:
 1. FBC sections 1905.1.3 (28-day tests), 1905.6.1.4 (average of two cylinder tests at 28 days).

2. The criteria for acceptance of concrete cylinder tests per FBC section 1905.6.2.3.

3.03 CLEANUP: All debris associated with this activity including excess material and truck washout shall be removed from the project site and properly disposed of.

END OF SECTION

SECTION 32 92 00

GRASSING

PART 1 - GENERAL

- 1.01 **DESCRIPTION:** The Contractor shall furnish all labor, equipment, and materials necessary for grassing all areas disturbed by his operations and any other areas on the plans indicated to receive grassing.
- 1.02 **JOB CONDITIONS:**
- A. It is the intent of this specification that all disturbed areas are to be restored, with sod.
 - B. Contractor shall take all steps practical to minimize the area required to be sodded or seeded.
 - C. All grassing shall be in accordance with Section 570-1 through 570-4 or Section 575-1 through 575-3 of the FDOT Standard Specifications for Road and Bridge Construction, except as modified herein.
- 1.03 **STORAGE OF MATERIALS:** The Contractor shall provide space for storage of sod prior to placement in a manner that will not endanger or restrict pedestrian or vehicular traffic or interfere with other aspects of the work. Sod stored on site for more than 24 hours shall not be used.

PART 2 - PRODUCTS

- 2.01 **SOD:**
- A. **Types:** Sod shall be Common Bermuda Grass. Sod shall be well matted with roots. Where sodding will adjoin, or be in sufficient proximity to, private lawns, types of sod other than those listed above may be required. Sod shall be delivered in commercial-sized rectangles, preferably 12-inch by 24-inch or larger.
 - B. **Condition:** The sod shall be sufficiently thick to secure a dense stand of live grass. The sod shall be live, fresh, and uninjured at the time of planting. It shall have a soil mat of sufficient thickness adhering firmly to the roots to withstand all necessary handling. It shall be reasonably free of weeds and other grasses. It shall be planted as soon as possible after being dug and shall be kept moist from the time it is dug until it is planted.

2.02 SEED:

- A. **General:** Seed shall be Bermuda Grass. All seed shall meet the requirements of State Department of Agriculture and Consumer Services and all applicable State laws. The seed shall have been harvested from the previous year's crop. When a low percentage of grass seed or native seed germination causes the quality of the seed to fall below the minimum pure live seed percentage as specified below, the Contractor may elect, subject to the approval of the Engineer, to increase the rate of application sufficiently to obtain the minimum germination rate specified. No payment will be made for the added seed.
- B. **Delivery and Storage:** Each of the species or varieties of seed shall be furnished and delivered in separate labeled bags. During handling and storing, the seed shall be cared for in such a manner that it will be protected from damage by heat, moisture, rodents, and other causes. All permanent and temporary grass seed shall have been tested within a period of six months of the date of planting.
- C. **Purity and Germination:** All permanent and temporary grass seed shall have a minimum percent of purity and germination as follows:
 - 1. Bermuda Grass Seed shall be of common variety with a minimum pure seed content of 95 percent with a minimum germination of 85 percent.
 - 2. Winter Mix: Between the months of October to March the Contractor may place a seed mixture containing 80% Common Bermuda and 20% Rye Grass.
 - 3. Summer Mix: Between the months of June to August the Contractor may place a seed mixture containing 80% Common Bermuda and 20% Millet.

2.03 MULCH: The mulch material used shall normally be dry mulch. Dry mulch shall be straw or hay, consisting of oat, rye, or wheat straw, or of pangola, peanut, coastal Bermuda or Bahia grass hay. Only undeteriorated mulch which can readily be cut into the soil shall be used.

2.04 GRASSING EQUIPMENT:

- A. **Seed Spreader:** The seed spreader shall be an approved mechanical hand spreader or other approved type of spreader.
- B. **Equipment for Cutting Mulch into Soil:** The mulching equipment shall be of a type capable of cutting the specified materials uniformly into the soil and to the required depth. Harrows will not be allowed.

- C. Rollers: A cultipacker, traffic roller, or other suitable equipment will be required for rolling the grassed areas.

PART 3 - EXECUTION

3.01 GENERAL CONSTRUCTION REQUIREMENTS: Grassing shall be incorporated into the project at the earliest practical time in the life of the contract. All grassing shall be installed prior to Substantial Completion.

3.02 SODDING:

- A. Preparation of Area to be Sodded: The ground which is to receive sod shall have been graded to proper elevations to match preconstruction conditions or proposed grades. All disturbed swales and ditches shall have been restored to their preconstruction condition or better. The prepared soil shall be loose and reasonably smooth. It shall be reasonably free of large clods, roots, patches of existing grass, and other material which will interfere with the sod-laying operations or subsequent mowing and maintenance operations.
- B. Laying of Sod: Sod shall be installed in all areas indicated on drawings or so designated by Engineer. Sod shall be carefully placed so that each piece abuts flush to all surrounding sod, regardless of whether surrounding sod is new or existing. Where new sod is to be placed adjacent to existing sod, the new sod must be cut in to match the elevation of the existing sod. Uneven sod which might cause mowing problems will be rejected. New sod laid on top of existing sod will also be rejected. All sod placed on steep slopes (greater than 1:1) shall be pinned with a wooden pin to keep it in place.
- C. Rolling: Immediately after completion of the sod laying, the entire sodded area shall be rolled thoroughly with the equipment specified. At least two trips over the entire area will be required.
- D. Watering: Newly-sodded areas are to be watered by Contractor as necessary to keep sod alive until the Contract is closed out. Dead sod shall be replaced by Contractor prior to contract closeout.

3.03 SEEDING:

- A. General:
1. Seed shall only be placed where required for immediate erosion control or as directed by the Engineer and shall not preclude the area from requiring sod at the conclusion of the project.

2. Seeding or mulching operations will not be permitted when wind velocities exceed 15 miles per hour.
 3. Seed shall be sown only when the soil is moist and in proper condition to induce growth.
 4. No seeding shall be done when the ground is frozen, unduly wet, or otherwise not in a tillable condition.
 5. The operations involved in the work shall proceed in the following sequence: preparation of the ground, seeding, spreading, and cutting in mulch.
- B. Preparation of Area to be Seeded: The ground over which the seed is to be sown shall be prepared by disk-harrowing and thoroughly pulverizing the soil to a suitable depth. The prepared soil shall be loose and reasonably smooth. It shall be reasonably free of large clods, roots, and other material which will interfere with the work or subsequent mowing and maintenance operations.
- C. Application of Seed: While the soil is still loose, the seed shall be scattered uniformly over the grassing area and immediately mixed into the seed bed to a depth of one-half inch. Quick-growing-type grass seed shall be a species which will provide an early ground cover during the particular season when planting is done and will not later compete with permanent grass. The separate types of seed used shall be thoroughly dry-mixed immediately before sowing. Seed which has become wet shall not be used.
- D. Mulching: When mulching is called for, approximately two inches, loose thickness, of the mulch material shall then be applied uniformly over the seeded area, and the mulch material cut into the soil with the equipment specified, so as to produce a loose mulched thickness of three to four inches. Care shall be exercised that the materials are not cut too deeply into the soil. No artificial watering of the mulch shall be done before it is applied.
- E. Rolling: Immediately after completion of the seeding, the entire grassed or mulched area shall be rolled thoroughly with the equipment specified. At least two trips over the entire area will be required.
- F. Watering: Newly-seeded areas are not to be watered to force the seed germination but only to sustain grass growth.
- G. Operations on Steep Slopes: On steep slopes when mulching is called for, the mulch material may be anchored down in lieu of being cut into the soil by use of a machine. Anchoring may be done by either of the following methods:

1. Placing a layer of soil, approximately two inches thick by nine inches wide, along the upper limits of the mulch, and spotting soil piles over the rest of the area at a maximum spacing of four feet.
2. Spreading a string net over the mulch, using stakes driven flush with the top of the mulch, at six-foot centers, and stringing parallel and perpendicular, with diagonals in both directions.

3.04 MAINTENANCE: The Contractor shall, at his expense, maintain grassed areas in a satisfactory condition until final acceptance of the project. Such maintenance shall include the filling, leveling, and repairing of any washed or eroded areas, as may be necessary and routine maintenance such as mowing and edging to maintain a presentable appearance. The Engineer, at any time, may require replanting of any areas in which the establishment of the grass stand does not appear to be developing satisfactorily. If a planted area must be replanted such replacement shall be at the Contractor's expense. If replanting is necessary due to factors determined to be beyond the control of the Contractor, payment for replacement will be made under the appropriate contract pay items.

END OF SECTION

SECTION 32 93 00

PLANTS

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Preparation of subsoil.
- B. Topsoil bedding.
- C. New trees, plants, and ground cover.
- D. Mulch and Fertilizer.
- E. Maintenance.
- F. Tree Pruning.

1.02 REFERENCE STANDARDS

- A. ANSI/ANLA Z60.1 - American Standard for Nursery Stock; 2004.
- B. ANSI A300 Part 1 - American National Standard for Tree Care Operations -- Tree, Shrub and Other Woody Plant Maintenance -- Standard Practices; 2008.

1.03 DEFINITIONS

- A. Weeds: Any plant life not specified or scheduled.
- B. Plants: Living trees, plants, and ground cover specified in this Section, and described in ANSI Z60.1.

1.04 SUBMITTALS

- A. See Section 01 30 00 - Administrative Requirements, for submittal procedures.
- B. Maintenance Data: Include cutting and trimming method; types, application frequency, and recommended coverage of fertilizer, and watering.

1.05 QUALITY ASSURANCE

- A. Nursery Qualifications: Company specializing in growing and cultivating the plants with three years documented experience.
- B. Tree Pruning: NAA - Pruning Standards for Shade Trees.
- C. Maintenance Services: Performed by installer.

1.06 REGULATORY REQUIREMENTS

- A. Comply with regulatory agencies for fertilizer and herbicide composition.
- B. Provide certificate of compliance from authority having jurisdiction indicating approval of plants, fertilizer and herbicide mixture.
- C. Plant Materials: Certified by state department of agriculture; free of disease or hazardous insects.

1.07 DELIVERY, STORAGE, AND HANDLING

- A. Deliver fertilizer in waterproof bags showing weight, chemical analysis, and name of manufacturer.
- B. Protect and maintain plant life until planted.

- C. Deliver plant life materials immediately prior to placement. Keep plants moist.

1.08 FIELD CONDITIONS

- A. Do not install plant life when ambient temperatures may drop below 35 degrees F or rise above 90 degrees F.
- B. Do not install plant life when wind velocity exceeds 30 mph.

1.09 WARRANTY

- A. See Section 01 78 00 - Closeout Submittals, for additional warranty requirements.
- B. Warranty: Include coverage for one continuous growing season; replace dead or unhealthy plants.
- C. Replacements: Plants of same size and species as specified, planted in the next growing season, with a new warranty commencing on date of replacement.
- D. Maintain plant life for three months after Date of Substantial Completion.
- E. Maintenance to include:
 1. Cultivation and weeding plant beds and tree pits.
 2. Applying herbicides for weed control in accordance with manufacturer's instructions. Remedy damage resulting from use of herbicides.
 3. Remedy damage from use of insecticides.
 4. Irrigating sufficient to saturate root system.
 5. Pruning, including removal of dead or broken branches, and treatment of pruned areas or other wounds.
 6. Disease control.
 7. Maintaining wrapping, guys, turnbuckles, and stakes. Adjust turnbuckles to keep guy wires tight. Repair or replace accessories when required.
 8. Replacement of mulch.

PART 2 PRODUCTS

2.01 PLANTS

- A. Plants: Species and size identified in plant schedule, grown in climatic conditions similar to those in locality of the work.
- B. Trees: Species and size identifiable in plant schedule, grown in climatic conditions similar to those in locality of the Work.

2.02 SOIL MATERIALS

- A. Topsoil: Fertile, agricultural soil, typical for locality, capable of sustaining vigorous plant growth, taken from drained site; free of subsoil, clay or impurities, plants, weeds and roots; minimum pH value of 5.4 and maximum 7.0.

2.03 SOIL AMENDMENT MATERIALS

- A. Fertilizer: Containing fifty percent of the elements derived from organic sources; of proportion necessary to eliminate any deficiencies of topsoil, as indicated in analysis..
- B. Peat Moss: Shredded, loose, sphagnum moss; free of lumps, roots, inorganic material or acidic materials; minimum of 85 percent organic material measured by oven dry weight, pH range of 4 to 5; moisture content of 30 percent.
- C. Lime: Ground limestone, dolomite type, minimum 95 percent carbonates.
- D. Water: Clean, fresh, and free of substances or matter that could inhibit vigorous growth of

plants.

2.04 MULCH MATERIALS

- A. Mulching Material: pine or cypress species wood shavings, free of growth or germination inhibiting ingredients.

2.05 ACCESSORIES

- A. Wrapping Materials: Burlap.
- B. Stakes: Softwood lumber, pointed end.
- C. Cable, Wire, Eye Bolts and Turnbuckles: Non-corrosive, of sufficient strength to withstand wind pressure and resulting movement of plant life.
- D. Plant Protectors: Rubber sleeves over cable to protect plant stems, trunks, and branches.
- E. Wrapping: Waterproof fabric.

2.06 TOP SOIL MIX

- A. A uniform mixture of 1 part peat and 3 parts topsoil by volume.

2.07 SOURCE QUALITY CONTROL

- A. Provide analysis of topsoil; comply with requirements of Section 01 40 00.
- B. Provide testing of imported topsoil.
- C. Analyze to ascertain percentage of nitrogen, phosphorus, potash, soluble salt and organic matter; pH value.
- D. Testing is not required if recent tests are available for imported topsoil. Submit these test results to the testing laboratory for approval. Indicate, by test results, information necessary to determine suitability.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Verify that prepared subsoil and planters are ready to receive work.
- B. Saturate soil with water to test drainage.

3.02 PREPARATION OF SUBSOIL

- A. Prepare subsoil to eliminate uneven areas. Maintain profiles and contours. Make changes in grade gradual. Blend slopes into level areas.
- B. Remove foreign materials, weeds and undesirable plants and their roots. Remove contaminated subsoil.
- C. Scarify subsoil to a depth of 3 inches where plants are to be placed. Repeat cultivation in areas where equipment, used for hauling and spreading topsoil, has compacted subsoil.
- D. Dig pits and beds 6 inches larger than plant root system.

3.03 PLACING TOPSOIL

- A. Spread topsoil to a minimum depth of 4 inches over area to be planted. Rake smooth.
- B. Place topsoil during dry weather and on dry unfrozen subgrade.
- C. Remove vegetable matter and foreign non-organic material from topsoil while spreading.

- D. Grade topsoil to eliminate rough, low or soft areas, and to ensure positive drainage.
- E. Install topsoil into pits and beds intended for plant root balls, to a minimum thickness of 6 inches.

3.04 FERTILIZING

- A. Apply fertilizer in accordance with manufacturer's instructions.
- B. Apply after initial raking of topsoil.
- C. Mix thoroughly into upper 2 inches of topsoil.
- D. Lightly water to aid the dissipation of fertilizer.

3.05 PLANTING

- A. Set plants vertical.
- B. Remove non-biodegradable root containers.
- C. Set plants in pits or beds, partly filled with prepared plant mix, at a minimum depth of 6 inches under each plant. Remove burlap, ropes, and wires, from the root ball.
- D. Place bare root plant materials so roots lie in a natural position. Backfill soil mixture in 6 inch layers. Maintain plant life in vertical position.
- E. Saturate soil with water when the pit or bed is half full of topsoil and again when full.

3.06 PLANT SUPPORT

- A. Brace plants vertically with plant protector wrapped guy wires and stakes to the following:
 1. Tree Caliper: 2 to 4 inches; Tree Support Method: 3 guy wires with eye bolts and turn buckles
 2. Tree Caliper: Over 4 inches; Tree Support Method: 4 guy wires with eye bolts and turn buckles

3.07 TREE PRUNING

- A. Perform pruning of trees as recommended in ANSI A300.
- B. Prune newly planted trees as required to remove dead, broken, and split branches.

3.08 FIELD QUALITY CONTROL

- A. Plants will be rejected if a ball of earth surrounding roots has been disturbed or damaged prior to or during planting.

3.09 MAINTENANCE

- A. Provide maintenance at no extra cost to City of Fernandina Beach, Florida; City of Fernandina Beach, Florida will pay for water.
- B. Irrigate sufficiently to saturate root system and prevent soil from drying out.
- C. Cultivate and weed plant beds and tree pits.
- D. Remove dead or broken branches and treat pruned areas or other wounds.
- E. Neatly trim plants where necessary.
- F. Immediately remove clippings after trimming.
- G. Water to prevent soil from drying out.
- H. Control growth of weeds. Apply herbicides in accordance with manufacturer's instructions.

- I. Control insect damage and disease. Apply pesticides in accordance with manufacturers instructions.
- J. Remedy damage from use of herbicides and pesticides.
- K. Replace mulch when deteriorated.
- L. Maintain wrappings, guys, turnbuckles, and stakes. Adjust turnbuckles to keep guy wires tight. Repair or replace accessories when required.

3.10 SCHEDULE - PLANT LIST (See Drawings)

END OF SECTION

SECTION 33 11 00

PIPEWORK - WATER DISTRIBUTION SYSTEM

PART 1 - GENERAL

1.01 DESCRIPTION: Work under this Section consists of furnishing all materials, supplies, equipment and labor in accordance with the requirements set forth herein and as shown on the drawings.

1.02 APPLICABLE CODES, STANDARDS AND SPECIFICATIONS: The work under this Contract shall be in strict accordance with the following codes and standards.

- A. All Local, County, Municipal and Federal Codes.
- B. American National Standards Institute (ANSI).
- C. American Society for Testing and Materials (ASTM).
- D. American Water Works Association (AWWA).
- E. American Association of State Highway and Transportation Officials (AASHTO).
- F. Florida Department of Transportation Specifications (DOT).
- G. Recommended Standards for Water Works, 10-States Standards.
- H. Florida Dept. of Environmental Protection.

1.03 QUALITY ASSURANCE STANDARDS:

- A. American National Standards Institute, Inc. (ANSI)/ American Water Works Association (AWWA).
 - 1. ANSI/AWWA C104, Cement-Mortar Lining for Ductile-Iron Pipe and Fittings for Water.
 - 2. ANSI/AWWA C105, Polyethylene Encasement for Ductile - Iron Piping for Water and Other Liquids.
 - 3. ANSI/AWWA C111, Rubber-Gasket Joints for Ductile-Iron and Gray-Iron Pressure Pipe and Fittings.
 - 4. ANSI/AWWA C115, Flanged Ductile-Iron Pipe with Threaded Flanges.

5. ANSI/AWWA C150, Thickness Design of Ductile-Iron Pipe.
6. ANSI/AWWA C151, Ductile-Iron Pipe, Centrifugally Cast in Metal Molds or Sand-Lined Molds for Water or Other Liquids.
7. ANSI/AWWA C153, Ductile-Iron Compact Fittings, 3 In. Through 16 In., for Water and Other Liquids.
8. AWWA C502, Dry-Barrel Fire Hydrants.
9. AWWA C504, Rubber-Seated Butterfly Valves.
10. AWWA C515, Reduced Wall, Resilient-Seated Gate Valves for Water Supply Service.
11. AWWA C600, Installation of Ductile-Iron Water Mains and Their Appurtenances.
12. AWWA C651, Disinfecting Water Mains.
13. AWWA C701, Cold-Water Meters - Turbine Type, for Customer Service.
14. AWWA C800, Underground Service Line Valves and Fittings.
15. AWWA C900, Polyvinyl Chloride (PVC) Pressure Pipe, 4 In. Through 12 In., for Water Distribution.
16. AWWA C905, Polyvinyl Chloride (PVC) Pressure Pipe and Fabricated Fittings, 14 In. through 48 In. for Water Transmission and Distribution.

B. American Society for Testing and Materials (ASTM):

1. D1785, Poly (Vinyl Chloride) (PVC) Plastic Pipe, Schedules 40, 80 and 120.
2. D-2464, Threaded Poly (Vinyl Chloride) (PVC) Plastic Pipe Fittings, Schedule 80.
3. D2467, Socket Type Poly (Vinyl Chloride) (PVC) Plastic Pipe Fittings, Schedule 80.
4. D2564, Solvent Chemicals for Poly (Vinyl Chloride) (PVC) Plastic Pipe and Fittings.

5. D2855, Making Solvent Cemented Joints with Poly (Vinyl Chloride) (PVC) Pipe and Fittings.

C. Manufacturer's name and model numbers are listed to establish a standard of quality. Equivalent items of other manufacturers are acceptable.

1.04 SUBMITTALS:

A. Submit manufacturer's certification of materials' conformance to specifications.

B. Submit manufacturer's literature, catalog data and installation instructions.

C. Submit certified field pressure test reports.

D. Provide backflow preventer certification.

1.05 PRODUCT DELIVERY AND HANDLING:

A. Exercise care to prevent damage of product during loading, transporting, unloading and storage.

B. Do NOT drop pipe or fittings.

C. Do not store directly on ground and assure that materials are kept clean. Pipe shall be kept bundled and strapped until it is ready for installation in order to prevent warping or disfiguring.

D. Store material in areas approved by the Owner.

E. Store material in such a manner as to not create a nuisance or safety hazard.

PART 2 - PRODUCTS

2.01 PIPE:

A. General: Pipe shall be furnished free from defects impairing strength and durability and should be of best commercial quality for purpose specified. Structural properties shall be sufficient to safely sustain or withstand strains to which it is normally subjected. All pipe shall bear the National Sanitation Foundation Seal for potable water pipe.

1. Polyvinyl Chloride (PVC) 4 In. Through 12 In.:

a. Specification: AWWA C900.

- b. Compound: PVC 12454-B, ASTM D 1784.
 - c. Thickness: Class 150, DR 18.
 - 2. Polyvinyl Chloride (PVC), 3 In.:
 - a. Specification: ASTM D2241.
 - b. Compound: PVC 12454-B, ASTM D1784.
 - c. Thickness: Class 200, SDR 21.
 - 3. Polyvinyl Chloride (PVC), 2 In. and Smaller:
 - a. Specification: ASTM D1785.
 - b. Compound: PVC 12454-B, ASTM D1785.
 - c. Thickness: Schedule 40.
- C. Pipe Joints:
 - 1. Polyvinyl Chloride, 3 In. and Larger:
 - a. Push On: ASTM F477 Elastomeric Gaskets
 - b. Restrained: UNI-BELL B-13, Uni-Flange Restrainer; Megalug 2000 PV and 1600 Series.
 - 2. Polyvinyl Chloride, 2 In. and Smaller:
 - a. Screwed: ASTM D2464.
 - b. Solvent Weld: ASTM D2855.
 - c. Solvent: ASTM D2564.
- D. Pipe Fittings:
 - 1. Polyvinyl Chloride (PVC) 2 In. and Smaller:
 - a. ASTM D2464, Schedule 40 PVC threaded fittings.
 - b. ASTM D2467, Schedule 40 PVC socket type fittings.
 - c. ASTM D2855, solvent weld joints.

E. Pipe Marking and Identification:

1. PVC Pipe:

- a. All non-metallic water main pipe installed underground shall have a #12 gauge, solid strand, type UF insulation trace wire (blue in color) attached for locating purposes. Half hitches shall be made behind each pipe bell and on each side of a valve or fitting. Branch splices shall be made at all tees, fire hydrants, and service lines. Trace wire shall be run into valve boxes. Watertight splicing connectors shall be utilized for all splices. Contractor shall be responsible for continuity of trace wire between valve boxes.
- b. All PVC water main pipe shall be manufacturer's standard blue color or shall have permanent marking tape attached with the words "WATER MAIN" printed along the tape. In addition, similar marking tape shall be placed in the trench over the pipe, six to twelve inches below finish grade, for the entire length of pipe.

2.02 GATE VALVES:

- A. Larger than Two Inch: Shall be AWWA C515, iron body, resilient wedge, resilient seat, non-rising bronze stem with 2" square operating nut on buried valves, turn to left (counter clockwise) to open.
 1. Working pressure of 200 psi.
 2. Internal Metal Surfaces shall have two-part thermosetting epoxy coating, 4 mils thick.
 3. Sealing Mechanism shall have zero leakage at 200 psi with flow in either direction.
 4. End Conditions: Fit joints specified and/or required for piping.
 5. Acceptable: Mueller Series A-2370, American Series 2500 or equal.
- B. Two Inch and Smaller:
 1. Type III (double wedge disc, rising stem, inside screw).
 2. Class B (150 lb. steam rating).
 3. Threaded ends.

2.03 TAPPING SADDLES:

- A. For Ductile Iron Mains: Service Saddles shall be made of malleable or ductile iron with a 4-bolt, stainless steel, ductile iron, cast brass or bronze strap.
- B. For Polyvinyl Chloride (PVC) Mains: Service Saddles shall be made of cast brass or bronze with a 4-bolt stainless steel, cast brass or bronze strap.
- C. The backside face of the saddle shall be provided with an extra-wide neoprene-rubber gasket.
- D. The inside diameter of the saddle shall match that of the pipe outside diameter for a size-size match.

2.04 PLASTIC LOCATING AND MARKING TAPE: Tape shall be plastic coated foil with a minimum width of 2 inches. Tape shall be highly visible and shall have the words "WATER MAIN" in at least 1" letters printed at least every 36 inches along the tape. Tape shall be located one foot below ground surface directly above the centerline of the pipe. Tape shall be Allen Marking Tape or equal.

2.05 CONCRETE: Concrete for valve box covers shall have a minimum compressive strength of 2,500 p.s.i. at 28 days. Slump shall not be more than 4 inches.

2.06 VALVE BOXES:

- A. Provide at all manually operated valves installed on underground lines.
- B. ASTM-A-48, cast iron, Class 30-B, 3-piece extension type, with cover marked "WATER" and flared base to suit valve furnished.
- C. Acceptable: Figure No. F-2450, Clow Corporation; Catalog No. H10357, Mueller Co.; Figure No. E-3002, M & H Valve and Fittings Co. or equal.
- D. See Typical Drawing Detail for concrete collar requirements.

2.07 HOSE BIBBS (3/4"):

- A. Body to be all brass construction.
- B. Male connection threads suitable for 3/4" hose connection.
- C. Loose key, anti-tamper operation.
- D. Anti-siphon check valve connection to hose.

2.08 FIRE HYDRANTS:

- A. AWWA C502 Dry-Barrel type fire hydrant with 5 1/4" main valve.
- B. Working Pressure Rating 150 psi.
- C. Provided with two 2 1/2 inch hose connections and one 4 1/2 in. hose connection.

2.09 WATER METERS:

- A. All Water Meters shall be AWWA C701, turbine-type, cold water meters. Meters shall have bronze bottoms, bronze lids, and annealed glass register cover, be made in the USA and come with a 15-year warranty, or as required by local utility.
- B. Meters of all sizes shall be manufactured by a single company with a repair facility located within 150 miles of the project site.

2.10 METER BOXES:

- A. Water Meter Boxes shall be of cast iron construction with an in-ground base and a removable cast iron cover. The overall size of the box shall accommodate the size of the water meter and the curb stop with additional space at each end of the box.
- B. Acceptable: Rome Valve Box or equal.

2.11 BACKFLOW PREVENTER: All backflow preventers shall be tested and certified.

- A. Reduced pressure zone backflow preventer (3/4" to 2"):
 - 1. Bronze body construction.
 - 2. Two (2) poppet-type check valve assemblies and relief valve.
 - 3. Unit shall have replaceable seats and springs and be capable of in-line maintenance.
 - 4. Four (4) test cocks for field testing.
 - 5. Minimum working pressure: 150 psi.

- B. Double check detector backflow preventer (2" to 10"):
1. Bronze or epoxy-coated cast iron body.
 2. Two (2) spring loaded center stem check valve assemblies and relief valve.
 3. Two (2) gate valves.
 4. Four (4) test cocks for field testing.
 5. Unit shall be of modular design and capable of in-line servicing.
 6. Replaceable seats.
 7. Minimum working pressure: 150 psi.
 8. 3/4" bypass meter with two (2) bronze double check valves. Bypass meter shall accurately record flows up to 3 gpm. Any flows above 3 gpm shall not damage the meter.

2.12 CHECK VALVES (3" TO 10"): All check valves shall be tested and certified.

- A. Check valve open with 1 psi pressure differential in direction of flow.
- B. Four (4) test cocks for field testing.
- C. Epoxy-coated cast iron body.
- D. Minimum rated working pressure: 175 psi.

PART 3 - EXECUTION

3.01 EXCAVATION:

- A. General: The Contractor shall perform all excavation of every description and of whatever substances encountered to the depths indicated on the drawings or as necessary. This shall include all necessary clearing and grubbing of any foreign substance encountered within the structure or trench area. Excavated material suitable for backfill shall be piled in an orderly manner at a sufficient distance from the trench to prevent slides or cave-ins.
- B. Protection of Existing Facilities and Utilities: All existing improvements such as pavements, conduit, poles, pipes and other structures, shall be carefully supported and fully protected from injury and, in case of damage, they shall be restored, pressure tested and disinfected by the Contractor without

compensation. Existing utilities and other underground obstructions are shown on the plans, but the accuracy of the locations and depths is not guaranteed. The Contractor shall contact all utilities prior to construction and arrange for the necessary assistance in locating and protecting the existing utilities. The Contractor shall be responsible for damages to these existing utilities and shall, in case they are damaged, restore them to their original condition.

- C. Trench Excavation: The minimum width of the trench shall be equal to the outside diameter of the pipe at the joint plus 8 in. each side of pipe for unsheeted or sheeted trench, with the maximum width of trench, measured at the top of the pipe, not to exceed the outside pipe diameter, plus 24 in., unless otherwise shown on the drawings. Trench walls shall be maintained vertical from the bottom of the trench to a line measured at the top of the pipe. From the top of the pipe to the surface of the trench walls shall be as vertical as possible under soil conditions.

No more than 300 linear feet of trench shall be open in advance of the completed pipe laying operation without prior approval of the Engineer. Pipe trenches across roadways and driveways shall be backfilled as soon as the pipe is installed. Where, in the opinion of the Engineer, adequate detour facilities are not available, no trench shall be left open across a roadway or commercial property driveway where adequate detour routes are not available for a period in excess of 30 minutes, or as directed by the governing authority. No trench shall be left open across any roadway or driveway for more than 24 hours. It shall be the Contractor's responsibility to provide traffic control and barricades as necessary.

- D. Shoring, Sheet piling and Bracing: The Contractor shall do all shoring, sheet piling and bracing or provide other approved facilities required to perform and protect the excavation and as necessary for the safety of the public, the employees, and the preservation of existing roads, structures and other utilities. The top of such sheet piling left in place shall be cut off at a minimum elevation of 2.5 ft. below finished grade. All excavation shall be in accordance with the Florida Trench Safety Act.
- E. Pavement Removal: The Contractor shall remove pavements as part of the trench excavation. The material from permanent pavement removal shall be carefully separated from trench excavation material and disposed of by the Contractor.
- F. Boulder Removal: All rocks, stones, boulders or concrete, having any dimension larger than permitted to be used for backfill in the paragraph entitled "Backfilling" of these Specifications, shall be removed from the site and disposed of by the Contractor.

- G. **Unsuitable Soil Conditions and Overdepth Excavation:** Where determined by Engineer or his representative that the soils encountered in the utility trench excavation are unsuitable for pipe bedding and/or backfill, the depth of excavation shall be increased as directed by Engineer or his representative. The bottom of the excavation shall be brought up to the proper excavation elevation utilizing suitable and properly-compacted backfill material or bedding material as directed by the Engineer or his representative. Bedding material if required, shall consist of ½" to 1" diameter gravel placed in bottom of trench at a thickness of 4 to 6 inches. Suitable backfill material shall then be installed and compacted over pipe as described in Paragraph 3.04.
- H. **Disposal of Excess Material:** The Contractor shall dispose of the excavated materials not required or suitable for backfill. All surplus excavated material which is unsuitable for fill shall become the property of the Contractor and shall be disposed of by the Contractor at his expense. Pieces of broken asphalt shall be carefully separated from suitable fill material and hauled to an asphalt plant for disposal or shall be disposed of by some other acceptable means by the Contractor at not expense to Owner. All excavated material not suitable for backfill (e.g., concrete, boulders, roots, etc.) shall be carefully separated from suitable fill material and disposed of by the Contractor at no expense to Owner. Owner has the option to accept suitable backfill material from the Contractor.

3.02 INSTALLATION OF WATER MAINS AND SERVICES:

- A. **General:** Unless otherwise noted on the drawings or in other sections of this Specification, the pipe shall be handled and installed in strict accordance with the manufacturer's instructions and with the applicable AWWA or ASTM Standards.
1. Polyvinyl Chloride Pipe - ASCE Manual No. 37, ASTM D2321.
 2. If a conflict exists between the manufacturer's instructions and the AWWA or ASTM Standards, the manufacturer's instructions shall govern.
 3. Examine area to receive pipe work for defects that adversely affect execution of work or cause deviation beyond allowable tolerances for piping clearances.
 4. Carefully examine each section of pipe or valve before installation. Do not use defective or damaged pipe or materials. Remove such pipe or material from project site immediately.
- B. **Preparation:** The Contractor shall use every precaution during construction to protect the pipe against the entry of nonpotable water, dirt, wood, small animals and other foreign material that would hinder the operation of the

pipeline. Where the groundwater elevation is above the bottom of the trench, the Contractor shall provide suitable dewatering equipment. All piping shall be placed in a dry trench, unless wet trench installation is approved by the Engineer.

- C. Depth of Cover: Unless otherwise shown on the drawings, or otherwise authorized by the Engineer, the pipe shall have a minimum cover of 30 inches in unpaved areas and 36 inches in paved areas.
- D. Connections to Existing Mains: The Contractor shall make connections to existing mains as shown on the drawings. Connections shall be made only after arrangements have been completed by the Contractor with the Owner of the system and shall be under the System Owner's immediate supervision. Contractor shall be required to restrain existing pipe as necessary in accordance with pipe restraint schedule.
- E. Pipe Thrust Restraints: Mechanical restrainers shall be installed as required to properly restrain all piping systems. At a minimum, restrainers shall be provided on all below-grade valves and fittings and at the required number of pipe joints in each direction. Required lengths of restrained pipe shall be as shown in pipe restraint schedule at end of this paragraph for the type of soil encountered. For above-grade piping, all valves and fittings shall be threaded, flanged or solvent welded with supports as required.

- B. Double check detector backflow preventer (2" to 10"):
1. Bronze or epoxy-coated cast iron body.
 2. Two (2) spring loaded center stem check valve assemblies and relief valve.
 3. Two (2) gate valves.
 4. Four (4) test cocks for field testing.
 5. Unit shall be of modular design and capable of in-line servicing.
 6. Replaceable seats.
 7. Minimum working pressure: 150 psi.
 8. 3/4" bypass meter with two (2) bronze double check valves. Bypass meter shall accurately record flows up to 3 gpm. Any flows above 3 gpm shall not damage the meter.

2.12 CHECK VALVES (3" TO 10"): All check valves shall be tested and certified.

- A. Check valve open with 1 psi pressure differential in direction of flow.
- B. Four (4) test cocks for field testing.
- C. Epoxy-coated cast iron body.
- D. Minimum rated working pressure: 175 psi.

PART 3 - EXECUTION

3.01 EXCAVATION:

- A. General: The Contractor shall perform all excavation of every description and of whatever substances encountered to the depths indicated on the drawings or as necessary. This shall include all necessary clearing and grubbing of any foreign substance encountered within the structure or trench area. Excavated material suitable for backfill shall be piled in an orderly manner at a sufficient distance from the trench to prevent slides or cave-ins.
- B. Protection of Existing Facilities and Utilities: All existing improvements such as pavements, conduit, poles, pipes and other structures, shall be carefully supported and fully protected from injury and, in case of damage, they shall be restored, pressure tested and disinfected by the Contractor without

compensation. Existing utilities and other underground obstructions are shown on the plans, but the accuracy of the locations and depths is not guaranteed. The Contractor shall contact all utilities prior to construction and arrange for the necessary assistance in locating and protecting the existing utilities. The Contractor shall be responsible for damages to these existing utilities and shall, in case they are damaged, restore them to their original condition.

- C. Trench Excavation: The minimum width of the trench shall be equal to the outside diameter of the pipe at the joint plus 8 in. each side of pipe for unsheeted or sheeted trench, with the maximum width of trench, measured at the top of the pipe, not to exceed the outside pipe diameter, plus 24 in., unless otherwise shown on the drawings. Trench walls shall be maintained vertical from the bottom of the trench to a line measured at the top of the pipe. From the top of the pipe to the surface of the trench walls shall be as vertical as possible under soil conditions.

No more than 300 linear feet of trench shall be open in advance of the completed pipe laying operation without prior approval of the Engineer. Pipe trenches across roadways and driveways shall be backfilled as soon as the pipe is installed. Where, in the opinion of the Engineer, adequate detour facilities are not available, no trench shall be left open across a roadway or commercial property driveway where adequate detour routes are not available for a period in excess of 30 minutes, or as directed by the governing authority. No trench shall be left open across any roadway or driveway for more than 24 hours. It shall be the Contractor's responsibility to provide traffic control and barricades as necessary.

- D. Shoring, Sheet piling and Bracing: The Contractor shall do all shoring, sheet piling and bracing or provide other approved facilities required to perform and protect the excavation and as necessary for the safety of the public, the employees, and the preservation of existing roads, structures and other utilities. The top of such sheet piling left in place shall be cut off at a minimum elevation of 2.5 ft. below finished grade. All excavation shall be in accordance with the Florida Trench Safety Act.
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PIPE RESTRAINT SCHEDULE

MINIMUM LENGTH OF PIPE (IN FEET) REQUIRED TO BE
RESTRAINED ON EACH SIDE OF A VALVE OR FITTING
FOR SANDY SOILS (SW, SP, SM, SC)

PIPE TYPE	PIPE SIZE	90° BEND	45° BEND	≤22.5° BEND	TEE OR CROSS	VERTICAL		REDUCER ^b	VALVE	DEAD END
						LOW	HIGH			
P V C P I P E	≤4	18	18	18	18	18	22	36	18	52
	6	24	18	18	18	18	30	38	36	73
	8	31	18	18	18	18	40	69	36	96
	10	37	18	18	18	18	48	93	54	115
	12	43	18	18	18	18	56	99	54	136
	14	49	20	18	18	18	64	101	72	155
	16	55	23	18	18	18	72	103	72	174
	18	60	25	18	36	20	80	104	72	192
	20	65	27	18	36	21	87	105	72	211
	24	75	31	18	36	25	102	134	90	246
	30	88	37	18	36	29	122	185	90	295

PIPE TYPE	PIPE SIZE	90° BEND	45° BEND	≤22.5° BEND	TEE OR CROSS	VERTICAL		REDUCER ^b	VALVE	DEAD END
						LOW	HIGH			
D U C T I L E I R O N	≤4	18	18	18	18	18	18	18	18	33
	6	20	18	18	18	18	19	35	36	47
	8	26	18	18	18	18	25	44	36	61
	10	31	18	18	18	18	30	60	54	73
	12	37	18	18	18	18	36	63	54	86
	14	41	18	18	18	18	41	64	72	98
	16	46	19	18	36	18	46	66	72	111
	18	51	21	18	36	18	51	66	72	122
	20	56	23	18	36	18	56	67	72	134
	24	64	27	18	36	21	65	85	90	156
	30	75	31	18	36	25	78	118	90	188

- Assumptions:
1. Pipe Test Pressure = 150 PSI
 2. Minimum Pipe Depth = 3.0 Feet
 3. Laying Condition = Type 5
 4. Safety Factor = 2.0

^a "Low" represents the minimum length of pipe (in feet) required to be restrained on the low side of the vertical offset, which is typically downstream of the offset fitting. "High" represents the minimum length of pipe (in feet) required to be restrained on the high side of the vertical offset, which is typically upstream of the offset fitting. Required restrained lengths assume an offset angle $\leq 45^\circ$.

^b Distance represents the linear feet of large diameter pipe upstream of the reducer required to be restrained. Restrain small diameter pipe at reducer at a minimum. If there is an unobstructed run downstream of the reducer (i.e. small diameter pipe) of at least 2.5 times the required length of large diameter pipe to be restrained, then restraint is required only at the reducer fitting. If small end of reducer is more than three pipe sizes smaller than large end, consult Engineer for required length to be restrained.

3.03 WATER AND SEWER LINE ORIENTATION:

- A. **Water Mains Crossing Above Sewer Lines:** Potable water mains crossing above sanitary sewer lines (gravity and force mains) and storm sewers shall be laid to provide a minimum vertical distance of 18 inches between the invert of the water main and the crown of the sanitary sewer and/or storm sewer line. Where this minimum separation cannot be maintained, the crossing shall be arranged so that the water pipe joints and the sewer main joints are equal distance from the point of crossing with no less than 10 feet (outside of pipe to outside of pipe) between any two joints. Alternatively, the sanitary sewer and/or storm sewer main may be replaced with 20 foot long section(s) of ductile iron pipe with "polybond" lining, placed in a sleeve, or encased in concrete to obtain the equivalent of the required 10-foot separation of joints. However, the water or sewer line or both must be ductile iron in the area of the crossing for ten feet in both directions. The method of obtaining separation shall be as indicated on the drawings or, if not indicated on the drawings, as directed by the Engineer. The contractor shall notify the Engineer immediately upon encountering situations not indicated on the drawings where inadequate separation between water and sewer lines may occur.
- B. **Water Mains Crossing Below Sewer Lines:** Water mains crossing below sanitary sewer and/or storm sewer lines, regardless of vertical separation, shall require that the sanitary sewer and/or storm sewer be replaced with "polylined" ductile iron pipe, placed in a sleeve, or encased in concrete to obtain a 10-foot minimum horizontal separation between any two pipe joints. However, the water or sewer line or both must be ductile iron in the area of the crossing for ten feet in both directions. The method of obtaining separation shall be as indicated on the drawings or, if not indicated on the

drawings, as directed by the Engineer. Contractor shall notify the Engineer immediately upon encountering situations not indicated on drawings where inadequate separation between water and sewer lines may occur.

- C. **Horizontal Separation Between Water Mains and Sewer Lines:** A minimum horizontal separation of 10 feet shall be maintained between all water main joints and all sewer line joints, regardless of whether the lines cross or run parallel to each other. Water mains and sewer lines may be laid with less than 10 feet horizontal separation (outside of pipe to outside of pipe; 5 feet for reuse water mains) provided that one or more of the following conditions is satisfied:
1. The crown of the sewer line is a minimum of 18 inches below the invert of the water main.
 2. The sewer line is constructed of or replaced with 20 LF section(s) of ductile iron pipe with "polybond" lining.
 3. Sewer line is placed in a sleeve.
 4. Sewer line is encased in concrete.
 5. The pipes are laid where the water main joints and the sewer main joints are staggered ten feet apart.
 6. The water main or the sewer main is constructed of HDPE pipe without mechanical joints.

The method of obtaining separation shall be as indicated on the drawings or, if not indicated in the drawings, as directed by the Engineer. Contractor shall notify the Engineer immediately upon encountering situations not indicated on the drawings where inadequate separation between water and sewer lines may occur.

- D. **Concrete Encasement of Pipe:** Where concrete encasement of pipe is required for obtaining separation from other pipes or for other reasons (e.g., inadequate cover), the pipe shall be encased with 3,000 psi concrete having a minimum thickness of 6 inches all around the outside of the pipe. Pipe must be supported in trench to allow 6 inches of concrete on all sides. Concrete must be mechanically vibrated into place. The Engineer or his representative must be present at the time of encasement.

3.04 BACKFILLING:

- A. **Material:** All backfill shall be excavated material, essentially free of organic material, asphaltic concrete, clay, concrete, boulders and other deleterious material.

1. Bedding and Pipe Embedment: The material in the bedding, around the pipe and to a depth of 1 ft. over the pipe, shall be AASHTO A-3 sand.
2. Above Pipe Embedment: The material shall be sand or a mixture of sandy material with rock, stone and shell. Rock, stone and shell shall pass through a 3-1/2 inch ring.
3. Top of Backfill: The top 12 inches of the backfill shall be topsoil and/or AASHTO A-3 sandy material.
4. Additional Fill: If sufficient suitable backfill material is not available from the excavation, additional fill meeting the above requirements shall be provided by the Contractor.

B. Placing and Compaction:

1. Under Pavement: Where the excavation is made through existing or proposed pavements, including shoulders, curbs, driveways, sidewalks, or structures, the entire backfill to the subgrade of the pavement or structures shall be made with predominantly sandy material free from rock, stones or organic matter, except that rocks passing a 3-1/2 inch ring will be permitted in the backfill between the elevation one foot above the top of the pipe and the bottom of the pavement subgrade.

The entire backfill material, including the material placed around and one foot above the pipe, shall be compacted to a density of not less than 98% of the maximum density, as determined by AASHTO T-180. Particular care shall be taken to insure that the backfill at the haunch is free from voids and is properly compacted. Compaction by flooding or puddling will be permitted only by written authorization from the Engineer.

Roads, walks and driveways consisting of broken stone, gravel, clay, marl, shell, shellrock, or a conglomerate of such materials, are not considered as being permanent pavement.

2. In Areas Not Under Permanent Pavement: Within right-of-ways or other areas where permanent pavement does not exist or is not proposed, including roads, walks and driveways consisting of broken stone, gravel, clay, marl, shell, shellrock or conglomerate, the entire backfill to the subgrade of the pavement or structures shall be made with predominantly sandy material free from rock, stones or organic matter, except that rocks having a maximum dimension of 3 1/2 inch will be permitted in the backfill between the elevation 1 ft. above the top of the pipe and 1 ft. below the surface. Particular care shall be

taken to insure that the backfill at the haunch is free from voids and is properly compacted. The bedding and embedment shall be compacted to a density of not less than 98 percent of maximum as determined by AASHTO T-180. The backfill material above 1 ft over the pipe shall be compacted to a density of not less than 85 percent of the maximum density, as determined by AASHTO T-180. Compaction by flooding or puddling will be permitted only by written authorization from the Engineer.

- a. In areas where unpaved, stabilized roads exist, the Contractor shall restore the road to its original grade and condition. The finished stabilized road shall have a minimum LBR value of 40 for the top 12" of the roadbed. Payment for stabilized road restoration shall be included in the lump sum bid price for line work.
3. Miscellaneous: Backfilling around meter boxes, valve boxes and other structures shall be accomplished in the same manner as the connected pipe. Extreme care shall be used in backfilling wellpoint holes to prevent voids and settlement. If necessary, the holes should be plugged with a concrete slurry, such plugging to be at the expense of the Contractor.
4. Compaction Tests: The Engineer or his representative may at any time instruct the Contractor to partially excavate a previously backfilled trench or temporarily backfill a short section of the trench for the purpose of obtaining measurements of the density of the backfill. All density tests shall be paid for by the Contractor. Density tests shall be taken along the pipe a minimum of every 300 feet, at each road lane crossing, and as directed by Engineer. Density tests shall be taken in one foot lifts from bottom of trench to finished grade.

3.05 TESTING AND DISINFECTION:

- A. Flushing of Completed Pipelines: Each section of completed pipeline shall be thoroughly flushed. A minimum flow shall be used for flushing that will insure a velocity in the pipe of 2.5 ft. per second. Water required for testing and flushing will be furnished by the Owner at existing pipes and outlets. Contractor shall slowly fill system to eliminate air pockets, then flushed to remove particulates. Flushing shall comply with Figures 1 and 2, and Table 3 of AWWA C651. Provide corporation stops at any high points in line in order to bleed air from pipe. Contractor shall make provisions to properly dispose of water from his flushing operations. Flooding of streets and private property shall not be permitted. Contractor shall arrange with Owner 72 hours in advance of the time of flushing for the availability of water. Water required for testing and flushing will be furnished by the Owner from a potable water source satisfactory to the Owner.

- B. **Leakage Test:** The leakage test shall be conducted concurrently with the hydrostatic pressure test in the presence of the Engineer and shall be of not less than two hours in duration. The Contractor shall provide all necessary apparatus including a pump, flow measuring device, piping connections and fittings along with the necessary labor to conduct the test. All leaks evident at the surface shall be repaired and leakage eliminated regardless of total leakage shown by test. Lines which fail to pass tests shall be repaired and retested as necessary until test requirements are complied with. Defective materials, pipes, valves, and accessories shall be removed and replaced. The pipe lines shall be tested in sections between every consecutive in-line valve unless otherwise directed by the Engineer. The line shall be filled with water and all air removed, and the test pressure shall be maintained in the pipe for the entire test period by means of a force pump to be furnished by the Contractor. Accurate means shall be provided by the Contractor for measuring the water required to maintain this pressure. The amount of water required is a measure of the leakage. No pipe installation will be accepted until there is a demonstration that leakage is less than that allowed by Section 7.3.5 of AWWA C605. The test pressure shall be 150 psig and shall be maintained between 145 psig and 155 psig for a two hour duration.
- C. **Disinfection:** The disinfection of water main piping shall be conducted in accordance with AWWA C651 using the continuous-feed method and shall be performed by specially trained personnel. The new water piping shall be kept isolated from the existing distribution system using a physical separation (Figure 1 of AWWA C651) until satisfactory bacteriological testing has been completed. Provide all temporary filling, flushing and testing connections (complying with Figures 1 and 2 of AWWA C651), potable water, chemicals, sampling and bacteriological test results. The continuous-feed method shall include slowly and completely filling the main to remove air pockets, preliminary flushing, and filling the main with chlorinated water having a free chlorine concentration of no less than 25 mg/l. At the end of a 24-hour contact time, the heavily chlorinated water, having a free chlorine residual of not less than 10 mg/l, shall be flushed from the main until the chlorine concentration leaving the main is no higher than that prevailing in the existing distribution system. Neutralize the heavily chlorinated water leaving the main with one of the chemicals named in Appendix C of AWWA C651. Make final, permanent connections to existing mains in accordance with Section 4.6 of AWWA C651. Conduct bacteriological sampling and testing in accordance with Section 5 of AWWA C651. After sampling, maintain a minimum pressure of 20 psig in the mains until regulatory permission is granted to place the mains into service. Provide satisfactory test results consisting of two consecutive sets of samples, taken at least 24 hours apart, showing the absence of total coliform organisms and the presence of a chlorine residual. If necessary, re-disinfect until satisfactory test results are obtained.

3.07 PROTECTION: At the end of each workday the mains under construction shall be plugged to prevent the entry of small animals or rodents. Temporary plugs shall be provided for this purpose.

3.08 RESTORATION OF DAMAGED SURFACES, STRUCTURES AND PROPERTY:

- A. Where pavement, trees, shrubbery, fences or other property and surface structures not designated as pay items, have been damaged, removed or disturbed by the Contractor, whether deliberately or through failure to carry out the requirements of the contract documents, state laws, municipal ordinances or the specific direction of the Engineer, or through failure to employ usual and reasonable safeguards, such property and surface structures shall be replaced and repaired at the expense of the Contractor to a condition equal to that before work began within a time frame approved by the Engineer.
- B. Cleanup: The Contractor shall maintain the site of the work in a neat condition. The Contractor shall remove all excess materials, excess excavated materials, and all debris resulting from his operations a minimum of once per week.

END OF SECTION

NASSAU COUNTY
PUBLIC LIBRARY

FERNANDINA BEACH
BRANCH DEMOLITION,
RENOVATION, ADDITION
AND RELATED SITE WORK

PROJECT MANUAL
100% CONSTRUCTION
DOC
16 MAY 2013

EXHIBIT "B"**Resolution 2013-166
Exhibit "A"****LEASE AGREEMENT**

THIS LEASE AGREEMENT entered into this 19th day of November, 2013, between CITY OF FERNANDINA BEACH, a Florida municipality, ("CITY"), and Nassau County, Florida, a political subdivision of the State of Florida ("COUNTY").

WITNESSETH:

That CITY, for and in consideration of the covenants and agreements hereinafter mentioned to be kept and performed by the COUNTY, has demised and leased to the COUNTY, for the term and under the conditions hereinafter set out, that certain parcel in Nassau County, Florida ("Demised Premises"), being the premises located at 25 North 4th Street, Fernandina Beach, Florida 32034.

TO HAVE AND TO HOLD the Described Premises, together with all and singular the tenements, hereditaments and appurtenances thereunto belonging, or in anywise incident or appertaining, unto the COUNTY for the term of TWENTY (20) YEARS.

I. TERM

THIS LEASE shall commence on the Delivery Date by the City to the County of the Demised Premises pursuant to the Interlocal Agreement between the City and the County.

II. RENT

COUNTY agrees to pay to CITY, at CITY'S address, the rent of Six Hundred Thousand Dollars (\$600,000.00) as

EXHIBIT "B"

contemplated in Section 1.6 of the Interlocal Agreement between City and County as full payment of every type or kind, regardless of how characterized for the entire term of twenty (20) years. Said rent shall be payable in full upon acceptance and execution of this Lease Agreement, and delivery of the completed building.

III. USE OF PREMISES BY COUNTY

COUNTY shall use the premises for a public library.

IV. MAINTENANCE AND REPAIRS

CITY shall maintain and keep in good repair the Demised Premises. CITY shall pay and be responsible for all maintenance, repairs, and replacements to the Demised Premises, including but not limited to the exterior and interior of the building, plumbing, electrical, heating, air-conditioning, and landscaping.

V. INSURANCE

CITY and COUNTY each at its own expense, shall provide and keep in force such policies of insurance necessary to protect their property interests and for their own negligence associated with their activities at the Demised Premises.

VI. FIRE AND OTHER HAZARDS

In the event that the demised premises, or the major part thereof, are destroyed by fire, lightning, storm or other

EXHIBIT "B"

casualty, the CITY, at its option, may forthwith repair the damage to such demised premises at its own cost and expense. If the demised premises are damaged to such an extent that the COUNTY will be unable to occupy the demised premises for a period in excess of ninety (90) days, then the COUNTY may terminate the lease by providing written notice to CITY.

VII. INDEMNIFICATION

The City and County do not assume any liability for the acts, omissions or negligence of the other party. Each party shall indemnify and hold the other harmless from all claims, damages, losses and expenses arising out of or resulting from performance of their respective duties under this Agreement. Nothing contained herein shall constitute a waiver of immunity or limitation of liability the City or County may have under the doctrine of sovereign immunity or Section 768.28, Florida Statutes.

VIII. AUTHORITY TO SUBLEASE AND ASSIGN

COUNTY shall not sublease or assign its interest in the Demised Premises without prior written approval of the CITY.

IX. NOTICES

Whenever notice and all correspondence is given under this Agreement, it shall be sent by certified mail, return receipt

EXHIBIT "B"

requested, or Federal Express with signature required, as follows:

FOR THE CITY

City Manager
204 Ash Street
Fernandina Beach, FL 32034

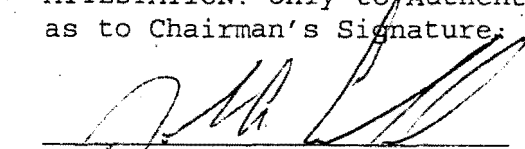
FOR THE COUNTY

County Manager
96135 Nassau Place, Suite 1
Yulee, Florida 32097

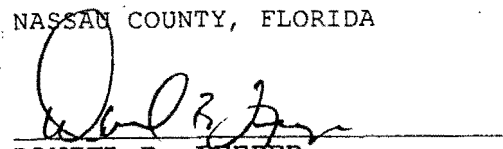
IN WITNESS WHEREOF, the parties hereto have hereunto executed this instrument for the purpose here expressed the day and year above written.

ATTESTATION: Only to Authenticity
as to Chairman's Signature:

BOARD OF COUNTY COMMISSIONERS
NASSAU COUNTY, FLORIDA



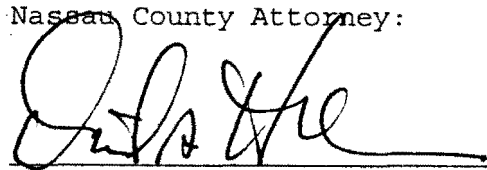
JOHN A. CRAWFORD
Ex-Officio Clerk



DANIEL B. LEEPER
Its: Chairman

NES
12-10-13


Approved as to form by the
Nassau County Attorney:



DAVID A. HALLMAN, ESQ.

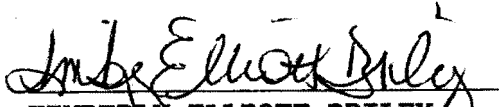
EXHIBIT "B"

CITY OF FERNANDINA BEACH,
FLORIDA




SARAH L. PELICAN
Its: Mayor

ATTEST:



KIMBERLY ELLIOTT BRILEY
Its: City Clerk Pro Tem

Approved as to form and legality:



TAMMI BACH
Its: City Attorney

EXHIBIT "B"

RESOLUTION 2013-166

A RESOLUTION OF THE CITY COMMISSION OF THE CITY OF FERNANDINA BEACH, FLORIDA, APPROVING A 20-YEAR LEASE AGREEMENT WITH THE BOARD OF COUNTY COMMISSIONERS OF NASSAU COUNTY FOR THE LEASE OF THE BUILDING AND IMPROVEMENTS LOCATED AT 25 NORTH 4TH STREET TO BE USED ONLY AS A PUBLIC LIBRARY WITH A TOTAL RENT PAYMENT OF \$600,000 TO BE PAID BY NASSAU COUNTY UPON EXECUTION OF THE LEASE AND DELIVERY OF THE BUILDING AFTER RENOVATIONS ARE COMPLETED; AUTHORIZING EXECUTION; AND PROVIDING FOR AN EFFECTIVE DATE.

WHEREAS, the Board of County Commissioners of Nassau County has proposed to lease the newly renovated City building located at 25 North 4th Street to be used solely as a public library after completion of renovations and expansion, and as rent, Nassau County proposes to pay \$600,000 toward the costs of design and construction to be credited as rent over the 20-year term of the Lease; and

WHEREAS, the City Commission believes it is in the best interests of the City to enter into a Lease Agreement with Nassau County to rent the newly renovated building located at 25 North 4th Street to be used only as a public library for a period of 20 years commencing on the date the renovations are completed by the City and the building delivered to Nassau County for lease.

NOW, THEREFORE, BE IT RESOLVED BY THE CITY COMMISSION OF THE CITY OF FERNANDINA BEACH, FLORIDA, THAT:


SECTION 1. The City Commission hereby approves the Lease Agreement with Nassau County attached hereto as Exhibit "A" which has been modified from the proposed Lease Agreement approved by the Board of County Commissioners of Nassau County on November 4, 2013 by deleting the third and fourth sentences of Section IV.

SECTION 2. The Mayor and City Clerk Pro Tem are hereby authorized to execute the Lease Agreement upon review and approval of the City Attorney and deliver to the Board of County Commissioners of Nassau County for approval and signature.

SECTION 3. This Resolution shall become effective immediately upon passage.


ADOPTED this 19th day of November, 2013.

CITY OF FERNANDINA BEACH




Sarah L. Pelican
Commissioner - Mayor

ATTEST:



Kimberly Elliott Briley
City Clerk Pro Tem

APPROVED AS TO FORM AND LEGALITY:



Tammi E. Bach
City Attorney