



Department of Purchasing & Contract Compliance

June 26, 2014

Re: #14ITB-51514K-MH
Renovation and Expansion at the Auburn Avenue Research Library

Dear Bidders:

Attached is one (1) copy of Addendum 4, hereby made a part of the above referenced **ITB**.

Except as provided herein, all terms and conditions in the **Bid** referenced above remain unchanged and in full force and effect.

Sincerely,

Mark Hawks

Mark Hawks
Assistant Purchasing Agent

Winner 2000 - 2009 Achievement of Excellence in
Procurement Award • National Purchasing Institute



#14ITB-51514K-MH
Renovation and Expansion at the Auburn Avenue Research Library

Addendum No. 4
Page Two

This Addendum forms a part of the contract documents and **modifies** the original ITB documents as noted below:

1. 2014 1JWRD Freelon Add.No.1

ACKNOWLEDGEMENT OF ADDENDUM NO. 4

The undersigned proposer acknowledges receipt of this addendum by returning one (1) copy of this form with the proposal package to the Department of Purchasing & Contract Compliance, Fulton County Public Safety Building, 130 Peachtree Street, Suite 1168, Atlanta, Georgia 30303 by the ITB due date and time **July 7, 2014, 2:00 P.M.**

This is to acknowledge receipt of Addendum No. 4, _____ day of _____, 20__.

Legal Name of Bidder

Signature of Authorized Representative

Title

ADDENDUM NO. 1
FOR
AUBURN AVENUE RESEARCH LIBRARY
EXPANSION AND MANOR RENOVATIONS

DATE: June 24, 2014
TO: Bidders
FROM: J.W. Robinson & Associates, Inc.
The Freelon Group, Inc. JV
RE: Auburn Avenue Research Library
101 Auburn Avenue
Atlanta, GA 30303



sealed stamp

This Addendum is hereby made a part of the bidding documents prepared by J.W. Robinson and Associates, Inc. and the Freelon Group, Inc. JV entitled Auburn Avenue Research Library Expansion and Major Renovations located in Atlanta, GA 30303 and supersedes all similar referenced heretofore mentioned. The following items are issued to delete, add, to modify, and to clarify. These items shall have full force and effect as the contract documents and cost involved shall be included in the Bid Quotations. Please acknowledge receipt of the Addendum on Bid Form.

sealed stamp



FULTON COUNTY

INVITATION TO BID #14ITB-51514K-MH

**Renovation and Expansion at the Auburn Avenue
Research Library (L009)**

For

Atlanta Fulton Public Library System

BID DUE DATE AND TIME: June 30, 2015 11:00 A.M.

BID ISSUANCE DATE: May 15, 2014

PRE-BID CONFERENCE DATE: May 29, 2014

PURCHASING CONTACT: Mark Hawks at (404) 612-5812

E-MAIL: mark.hawks@fultoncountyga.gov

**LOCATION: FULTON COUNTY DEPARTMENT OF PURCHASING &
CONTRACT COMPLIANCE
130 PEACHTREE STREET, S.W., SUITE 1168
ATLANTA, GA 30303**

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THE END

PERTAINING TO THE SPECIFICATIONS

DELETE	-	Specification Cover Sheet
REPLACE:	-	Specification Cover Sheet with bid number and dates added
DELETE:	-	Table of Contents dated May 15, 2014
REPLACE:	-	Table of Contents dated June 24, 2014
DELETE:	01 10 00	Summary dated May 2014
ADD:	01 10 00	Summary dated June, 2014
DELETE:	01 22 13	Measurement and Payment dated May 2014
ADD:	01 22 13	Measurement and Payment dated June, 2014
DELETE:	01 23 00	Alternates dated May 2014
REPLACE:	01 23 00	Alternates dated June, 2014
DELETE:	01 35 45	Cutting and Patching in its entirety
DELETE:	03 30 00	Cast-in Place Concrete dated May 2014
ADD:	03 30 00	Cast-in Place Concrete dated June 24, 2014
DELETE:	04 20 00 2.02	Brick Units; B-1 Color and Texture to match Architect is sample
MODIFY:	04 20 00 2.02	Brick Units B-1 Color and Texture to Match Existing Building Brick
DELETE:	09 30 00.1	Tiling dated May 2014
ADD:	09 30 00.1	Tiling dated June 24, 2014
DELETE:	09 51 00.1	Acoustical Ceiling dated May 2014
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DELETE:	09 62 23.1	Bamboo Flooring dated May 2014
ADD:	09 62 23.1	Bamboo Flooring dated June 24, 2014
DELETE:	09 62 23.1	Resilient Flooring dated May 2014
ADD:	09 62 23.1	Resilient Flooring dated June 24, 2014
DELETE:	09 68 00.1	Carpeting dated May 2014
ADD:	09 68 00.1	Carpeting dated June 24, 2014

DELETE: 09 68 13.1 Tile Carpeting dated May 2014
ADD: 09 68 13.1 Tile Carpeting dated June 24, 2014
ADD: 10 41 16 Emergency Key Cabinet dated June 2014
DELETE: 105633-3.08 B1 High Density File Storage Systems dated May 2014
ADD: 105633-3.08 B1 High Density File Storage Systems dated June 2014
ADD: 12 15 00 Art hanging and Display Systems dated June 2014
ADD: 14 20 10 2.02A4 Passenger Elevators dated June 2014
DELETE: 23 60 00 Equipment dated May 2014
ADD: 23 60 00 Equipment dated June 2014

SECTION 01 10 00

SUMMARY

PART 1 GENERAL

1.01 SUMMARY

- A. Project Identification: Auburn Avenue Research Library Expansion and Renovation L009.
- B. Owner: Atlanta-Fulton County Public Library
- C. Architect's Name: J.W. Robinson & Associates, Inc. | FREELON GROUP, INC. JV
- D. Project Summary: The Project consist of the general renovation and addition to existing research library facility located at the corner of Auburn Avenue and Courtland Street. The site contains approximately 1.09 acres of land in Land Lot 51, 14 District in the City of Atlanta, Fulton County. The Site is zoned Special Public Interest (SPI-1). The existing facility contains approximately 55,717 SF. After interior renovations, new floor infill and additions; the facility will contain approximately 67,453 Gross SF. New construction will be steel framed on concrete foundations and micro piles. The building will be under the jurisdiction of the City of Atlanta for permitting and construction related approvals.

1.02 CONTRACT DESCRIPTION

- A. Construction Delivery Method: Design-Bid-Build
- B. Particular Project Requirements:
 - 1. Existing site conditions and restrictions.
- C. Owner-purchased, Contractor-installed items:
 - 1. Contractor responsible for any wire management or connections to power related directly to the Owner FF&E or Contractor provided FF&E is the responsibility of the contractor.
 - 2. The County will remove all library collections prior to construction.
 - 3. Technology related equipment as indicated on the Technology Consultant's list as "Owner Provided, Owner Installed".
 - a. There will be County forces and representatives not directly controlled by the Contractor involved in, but not limited to, the delivery and installation of data wiring, data outlet covers, computers and other technology hardware and possibly on-site software installation or troubleshooting during project construction.
 - b. While the site is under control of the Contractor during construction and these others are subject to the contractor's safety plan and direction while there, the Contractor is required to reasonably coordinate and make allowances for necessary access by these forces/representatives to complete their work properly and on time within the Contractor's approved construction schedule.
 - 4. Technology related equipment as indicated on the Technology Consultant's list as "Contractor Provided, Contractor Installed." Installation includes any wire management & connections to power or data outlets related directly to the work.
- D. Owner's occupancy:
 - 1. Fulton County intends to occupy the Project upon Substantial Completion.
 - 2. Cooperate with Fulton County to minimize conflict and to facilitate Fulton County's operations.
 - 3. Schedule the Work to accommodate Fulton County occupancy.
- E. Permits and Fees: Apply for, obtain, and pay for permits, fees, and utility company backcharges required to perform the work. Submit copies to Architect and Owner. contractor is responsible for all fees associated with obtaining permits.
- F. Codes: Comply with applicable codes and regulations of authorities having jurisdiction. Submit copies of inspection reports, notices and similar communications to Architect.
- G. Dimensions: Verify dimensions indicated on drawings with field dimensions before fabrication or ordering of materials. Do not scale drawings.

Auburn Avenue Research Library Expansion and Renovation

L009

- H. Existing Conditions: Notify Architect of existing conditions differing from those indicated on the drawings. Do not remove or alter structural components without prior written approval.
- I. Coordination:
1. Coordinate the work of all trades.
 2. Prepare coordination drawings for areas above ceilings where close tolerances are required between building elements and mechanical and electrical work.
 3. Verify location of utilities and existing conditions.
- J. Installation Requirements, General:
1. Inspect substrates and report unsatisfactory conditions in writing.
 2. Do not proceed until unsatisfactory conditions have been corrected.
 3. Take field measurements prior to fabrication where practical. Form to required shapes and sizes with true edges, lines and angles. Provide inserts and templates as needed for work of other trades.
 4. Install materials in exact accordance with manufacturer's instructions and approved submittals.
 5. Install materials in proper relation with adjacent construction and with proper appearance.
 6. Restore units damaged during installation. Replace units which cannot be restored at no additional expense to the Owner.
 7. Refer to additional installation requirements and tolerances specified under individual specification sections.
- K. Limit of Use: Limit use of work as indicated. Keep driveways and entrances clear.
1. Construction Operations: Limited to areas noted on Drawings. Limits of work shall also conform to the LEED Credit requirements as specified in Section 01 3514.01- LEED Credit Summary.
 2. Provide access to and from site as required by law and by Fulton County:
 - a. 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.
 - b. Do not obstruct roadways, sidewalks, or other public ways without permit.
 3. Utility Outages and Shutdown:
 - a. Prevent accidental disruption of utility services to other facilities in the nearby vicinity.
- L. Existing Construction: Maintain existing building in a weathertight condition. Repair damage caused by construction operations.
- M. Definitions:
1. Provide: Furnish and install, complete with all necessary accessories, ready for intended use. Pay for all related costs.
 2. Approved: Acceptance of item submitted for approval. Not a limitation or release for compliance with the Contract Documents or regulatory requirements. Refer to limitations of 'Approved' in General and Supplementary Conditions.
 3. Match Existing: Match existing as acceptable to the Owner.
- N. Intent: Drawings and specifications are intended to provide the basis for proper completion of the work suitable for the intended use of the Owner. Anything not expressly set forth but which is reasonable implied or necessary for proper performance of the project shall be included.
- O. Writing Style: Specifications are written in the imperative mode. Except where specifically intended otherwise, the subject of all imperative statements is the Contractor. For example, 'Provide tile' means 'Contractor shall provide tile.'

PART 2 PRODUCTS - NOT APPLICABLE TO THIS SECTION

PART 3 EXECUTION - NOT APPLICABLE TO THIS SECTION

END OF SECTION

SECTION 01 22 13
MEASUREMENT AND PAYMENT

PART 1 GENERAL**1.01 RELATED DOCUMENTS**

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

1.02 SUMMARY

- A. The Bid lists each item of the Project for which payment will be made. No payment will be made for any items other than those listed in the Bid.
- B. Required items of work and incidentals necessary for the satisfactory completion of the work which are not specifically listed in the Bid, and which are not specified in this Section to be measured or to be included in one of the items listed in the Bid, shall be considered as incidental to the work. All costs thereof, including Contractor's overhead costs and profit, shall be considered as included in the lump sum or unit prices bid for the various Bid items. The Contractor shall prepare the Bid accordingly.
- C. Work includes furnishing all plant, labor, equipment, tools and materials, which are not furnished by the County and performing all operations required to complete the work satisfactorily, in place, as specified and as indicated on the Drawings.
- D. No zero bids will be accepted by the County.

1.03 DESCRIPTIONS

- A. Measurement of an item of work will be by the unit indicated in the Bid.
- B. Payment will include all necessary and incidental related work not specified to be included in any other item of work listed in the Bid.
- C. Unless otherwise stated in individual sections of the Specifications or in the Bid, no separate payment will be made for any item of work, materials, parts, equipment, supplies or related items required to perform and complete the work. The costs for all such items required shall be included in the price bid for item of which it is a part.
- D. "Products" shall mean materials or equipment permanently incorporated into the work.

1.04 EROSION AND SEDIMENTATION CONTROL

- A. General
1. No separate payment shall be made for temporary and/or permanent erosion and sedimentation controls.
 2. No payment will be made for any portion of the Project for which temporary erosion and sedimentation controls are not properly maintained.
- B. Construction Exits: All costs for construction exits, including installation, maintenance, repair, and removal, shall be included in the bid.
- C. Silt Fences: All costs for silt fences, where ordered by the Engineer, including installation, maintenance, repair, replacement, and removal, shall be included in the bid.
- D. Sediment Traps: All costs for sediment traps, including installation, maintenance, repair and removal, shall be included in the bid.
- E. Rip Rap: All cost for providing rip rap, including installation and maintenance, shall be included in the bid.
- F. Grassing
1. All cost for providing temporary and permanent grassing shall be included in the bid.

1.05 EARTHWORK

- A. Earth Excavation
1. No separate payment will be made for earth excavation. The cost of such work and all costs incidental thereto shall be included in the price bid for the item to which the work pertains.

2. All costs providing sheeting, shoring and bracing, including design, installation, maintenance, repair, replacement, and removal, shall be included in the price bid for sheeting, shoring, and bracing.
- B. Foundation Excavation
1. Where ordered by the Engineer, undercutting of rock and replacement with crushed stone will be paid for at the unit price bid for ROCK EXCAVATION. The quantity shall equal one foot of depth over the horizontal dimensions authorized by the Engineer.
 2. No separate payment will be made for concrete backfill of trenches beneath structures. The cost of this work and all costs incidental thereto shall be included in the price bid for the item to which the work pertains.
 3. Additional costs of corrective work, made necessary by unauthorized excavation of earth or rock, shall be borne by the Contractor.
- C. Dewatering: No separate payment will be made for dewatering required to accomplish the work.
- D. Backfilling: No separate payment will be made for backfilling or excavation, hauling and placement of borrow material. The cost of all such work and all costs incidental thereto shall be included in the unit price bid for the item to which the work pertains.

1.06 EARTH EXCAVATION

- A. No separate payment will be made for earth excavation. The cost of such work and all costs incidental thereto shall be included in the price bid for the item to which the work pertains.
1. All costs providing sheeting, shoring and bracing, including design, installation, maintenance, repair, replacement, and removal, shall be included in the price bid for sheeting, shoring, and bracing.
- B. Foundation Excavation
1. Where ordered by the Engineer, undercutting of rock and replacement with crushed stone will be paid for at the unit price bid for ROCK EXCAVATION. The quantity shall equal one foot of depth over the horizontal dimensions authorized by the Engineer.
 2. No separate payment will be made for concrete backfill of trenches beneath structures. The cost of this work and all costs incidental thereto shall be included in the price bid for the item to which the work pertains.
 3. Additional costs of corrective work, made necessary by unauthorized excavation of earth or rock, shall be borne by the Contractor.
- C. Dewatering: No separate payment will be made for dewatering required to accomplish the work.
- D. Backfilling: No separate payment will be made for backfilling or excavation, hauling and placement of borrow material. The cost of all such work and all costs incidental thereto shall be included in the price bid for the item to which the work pertains

1.07 TRENCH EXCAVATION AND BACKFILL

- A. No separate or additional payment will be made for any special or unique method, means, techniques or equipment necessary for the Contractor's compliance with these Specifications, regulatory requirements, permits, laws or regulations which govern this Project.
- B. Trench Excavation: No separate payment will be made for trench excavation. All costs shall be included in the unit price bid for the item to which it pertains at the appropriate depth.
- C. Sheeting, Bracing and Shoring: At cost for providing sheeting, shoring and bracing, including design, installation maintenance, repair, replacement, and removal, shall be included in the price bid for sheeting shoring and bracing.
- D. Trench Rock Excavation
1. Rock excavation shall be paid for as an extra. Payment will be made for the measured quantity of rock excavated, at the sum of the unit prices for Trench Rock Cost.
 2. The unit price for Trench Rock Cost is for the normally anticipated cost of rock excavation, the cost of additional bedding and backfill material as specified and all costs incidental thereto.
 3. The Engineer must be given reasonable notice to measure all rock.
 4. No allowance shall be made for excavating to extra widths for construction of manholes or other appurtenances, for excavating to sloping sides, or for excavations made necessary by the physical limitations

- of the Contractor's equipment. Cost of such additional rock excavation shall be included in the unit price bid for the item to which it pertains.
5. Dewatering Excavations: All costs of equipment, labor and materials required for dewatering shall be included in the price bid for the item to which it pertains.
 6. Bedding and Haunching
 - a. No additional payment will be made for additional trench depth.
 - b. No separate payment will be made for material used to provide specified bedding. The cost of all bedding materials shall be included in the unit price bid for the item to which it relates.
 - c. No additional payment will be made for improved bedding required to compensate for over excavation of the trench.
 7. Initial Backfill
 - a. No separate payment shall be made for initial backfill.
 - b. No separate payment shall be made for drying out the initial backfill material in order to meet the compaction requirements.
 - c. No separate payment shall be made for the adding of moisture to the initial backfill materials in order to meet the compaction requirements.
 - d. No separate payment shall be made for providing select material if the initial material cannot meet the compaction requirements.
- E. Final Backfilling
1. No additional payment will be made for additional material when excavated materials are used.
 - a. No separate payment shall be made for drying out the final backfill material in order to meet the compaction requirements.
- F. Dewatering Excavations: All costs of equipment, labor and materials required for dewatering shall be included in the price bid for the item to which it pertains.
- G. Initial Backfill
1. No separate payment shall be made for initial backfill.
 2. No separate payment shall be made for drying out the initial backfill material in order to meet the compaction requirements.
 3. No separate payment shall be made for the adding of moisture to the initial backfill materials in order to meet the compaction requirements.
 4. No separate payment shall be made for providing select material if the initial material cannot meet the compaction requirements.
- H. Final Backfilling
1. No additional payment will be made for additional material when excavated materials are used.
 2. No separate payment shall be made for drying out the final backfill material in order to meet the compaction requirements.
 3. No separate payment shall be made for the adding of moisture to the final backfill materials in order to meet the compaction requirements.
 4. No additional payment will be made for providing select material if the initial material cannot meet the compaction requirements.
- I. Additional Material: No separate payment will be made for additional earth or fill materials imported to the Project site.

1.08 SEWERS AND ACCESSORIES

- A. All costs related to the implementation of the easement and permit stipulations shall be included in the bid.

1.09 MOBILIZATION

- A. Mobilization shall consist of preparatory work and operation necessary to the performance or work required to complete this contract, including but not limited to the movement of personnel, equipment, supplier and incidentals to the project site.

1.10 FENCING

- A. Payment for permanent fence replacement, including labor, equipment and installation, shall be included in the bid.
- B. Payment for temporary fencing installation and removal, including labor and equipment, shall be included in the bid.

PRODUCTS (NOT USED)

EXECUTION (NOT USED)

END OF SECTION

SECTION 01 23 00

ALTERNATES

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Description of alternates.
- B. Procedures for pricing alternates.

1.02 ACCEPTANCE OF ALTERNATES

- A. Alternates quoted on Bid Forms will be reviewed and accepted or rejected at Owner's option. Accepted alternates will be identified in the Owner-Contractor Agreement.
- B. Coordinate related work and modify surrounding work to integrate the Work of each alternate.

1.03 SCHEDULE OF ALTERNATES

- A. Add alternate No. 1 – Add Previous Paver Installation:
 - 1. Alternative Item: **Provide additive alternate** to include addition of all labor and material associates with the installation of previous pavers as shown on drawings and specified. Base bid work shown within specification and Drawing number 8/L202, C3.0 including L010
 - 2. Alternative Item: Add installation of previous pavers as specified and detailed; in Drawing number [A101, 2/A201;] including 4/A721, 15/A721 and 13/A721
- B. Add Alternate No. [2] – Install new Precast Concrete Wall Panels;
 - 1. Base Bid: Retain existing marble wall panels in place and repair as necessary.
 - 2. Alternative item: Provide **Additive alternate to provide** all labor and material necessary to install precast concrete wall panels at the entry near the give away and the exterior wall along column line 5.1. Section 034500 and Drawing number A-101, A-721, including 2/a-201, 4/A-721, 15/A-721, 13/A-721.
- C. Add Alternate No. 3 – Mobil Kiosk:
 - 1. **Provide Additive Alternative Item:** Provide Mobile Kiosk Section [064100 – Architectural Wood Casework]
- D. Add Alternate No. 4 – Install 7'-0" high fence and gate at south entry:
 - 1. Alternate Item: **Provide additive alternate** to install fence and gate at rear entry and garden as shown on drawings and specified. Work to include all required.
- E. Add Alternate No [5] – Install Art Hanging System
 - 1. Alternative Item: Provide additive alternate to provide and install Art Hanging System on Gypsum wallboard walls in rooms 103, 120 and 203.
- F. Add Alternate No. [6] – Install Floating wood ceilings.
 - 1. **Alternate Item: Provide additive alternate to install new** wood ceilings. Drawing numbers A-121, A-122, A-123 and including details 2/A-121, 2/A-122 and 2/A-123.
- G. Add alternate No [7] – Add aluminum alloy metal wall panels and supporting structure:
 - 1. Alternate item: **Provide additive alternate** for providing all labor and materials associates with the addition of complete exterior decorative metals wall panels. Additive work shall include but is not demolition., masonry work and repair, structural work and repair to finishes associates with installation of the exterior wall panels as shown on sheet a-102, A-104 and 2/A-201 1/A-202 and A301.
- H. Add alternate No. [8]: Install Aluminum Alloy Metal Wall Panels within interior lobbies: floor lobby and third floor lobby. Drawing numbers A-102, A-103 including 4/A-721 and 15/A-721.

- I. Add Alternate No. [9]: Install Manual Roller Shades
1. Alternate Item: **Provide additive alternate** to: Install Manual Shades for rooms 104 and 105; specified in section 122124 - MANUAL AND ELECTRONIC ROLLER SHADE SYSTEM; and Drawing Numbers A/101 including note #5.
- J. Deductive Alternate No. [1] – Delete Auditorium Seating at Balcony room 206
1. Alternate item: **Provide deduction** for Deletion of theater seating in balcony from 206. Contractor to provide all finished and inn-floor electrical service and specified in Section 126100 – Fixed Audience Seating.
- K. Deductive Alternate No. [2] – Delete Auditorium Seating on first floor
1. Alternate Item: Provide deduction for Deletion of theater seating in main floor (first floor) of auditorium Contractor to provide all finishes and in –floor electrical service and specified in Section 126100 – Fixed Audience Seating.
- L. Deductive Alternate No. [23 – Install single ply TPO roofing system instead of Modified Bituminous Membrane Roofing System.
1. Base bid: Install Modified Bituminous Membrane Roofing System as specified within Section: 075500 – Modified Bituminous Membrane Roofing System and Drawings A-103, A-104 and A-105.
 2. Alternate Bid: Install complete Thermoplastic Polyolefin (TPO) roofing system as specified within Section 075423.
- M. Deductive alternative No. [4] – Cost associates with removing the High Density Carriages and Shelving from the 4th floor. Installation of the in-slab tracks for the High Density Carriages will occur if Deductive Alternate is accepted. Equipment, labor and materials associates with the work.
- N. Deductive alternative No. [5] – The Luminaire Schedules on Drawings E501, E502, and E503 contain the technical data associates with all the lighting fixtures on the project. Only the lighting fixture types that do not end in "ALT" shall be in the Contractor's base bid. As Deductive alternate 5, all the lighting fixture types that end in "ALT" shall be substituted in lieu of their base bid counterparts and the reduction in bid price shall be provided as a single lump sum dollar amount.

PART 2 PRODUCTS - NOT USED**PART 3 EXECUTION - NOT USED****END OF SECTION**

PART 1 GENERAL**1.01 SECTION INCLUDES**

- A. Section includes cast-in-place concrete work indicated in the Contract Documents or otherwise required for proper completion of the work.

1.02 RELATED SECTIONS

- A. Division 1 Section "Testing Laboratory Services".
- B. Division 3 Section "Concrete Forming".
- C. Division 3 Section "Concrete Reinforcement".
- D. Division 5 Section "Structural Steel Framing".
- E. Division 9 - Flooring

1.03 REFERENCES

- A. ACI 207.1R - Mass Concrete
- B. ACI 211.1- Standard Practice for Selecting Proportions for Normal, Heavyweight, and Mass Concrete.
- C. ACI 214 - Recommended Practice for Evaluation of Strength Test Results of Concrete.
- D. ACI 224.3R – Joints in Concrete Construction.
- E. ACI 233R – Ground Granulated Blast-Furnace Slag as a Cementitious Constituent in Concrete.
- F. ACI 301 - Specifications for Structural Concrete for Buildings.
- G. ACI 302.1 - Guide for Concrete Floor and Slab Construction.
- H. ACI 304 - Guide for Measuring, Mixing, Transporting and Placing Concrete.
- I. ACI 305 - Hot Weather Concreting.
- J. ACI 306 - Cold Weather Concreting.
- K. ACI 308 - Standard Practice for Curing Concrete.
- L. ACI 309 - Guide for Consolidation of Concrete.
- M. ACI 318 - Building Code Requirements for Structural Concrete.
- N. ASTM C31 - Standard Practice for Making and Curing Concrete Test Specimens in the Field.
- O. ASTM C33 - Standard Specification for Concrete Aggregates.
- P. ASTM C39 - Standard Test Method for Compressive Strength of Cylindrical Concrete Specimens.

- Q. ASTM C94 - Standard Specification for Ready-Mixed Concrete.
- R. ASTM C138 - Standard Test Method for Unit Weight, Yield, and Air Content (Gravimetric) of Concrete.
- S. ASTM C143 - Standard Test Method for Slump of Hydraulic Cement Concrete.
- T. ASTM C150 - Standard Specification for Portland Cement.
- U. ASTM C172 - Standard Practice for Sampling Freshly Mixed Concrete.
- V. ASTM C173 - Standard Test Method for Air Content of Freshly Mixed Concrete by the Volumetric Method.
- W. ASTM C230 - Standard Specification for Flow Table or Use in Tests of Hydraulic Cement.
- X. ASTM C260 - Standard Specification for Air-Entraining Admixtures for Concrete.
- Y. ASTM C309 - Standard Specification for Liquid Membrane-Forming Compounds for Curing Concrete.
- Z. ASTM C330 - Standard Specification for Lightweight Aggregates for Structural Concrete.
- AA. ASTM C494 - Standard Specification for Chemical Admixtures for Concrete.
- BB. ASTM C495 - Standard Test Method for Compressive Strength of Lightweight Insulating Concrete.
- CC. ASTM C567 - Standard Test Method for Unit Weight of Structural Lightweight Concrete.
- DD. ASTM C618 - Standard Specification for Fly Ash and Raw or Calcined Natural Pozzolan for Use as a Mineral Admixture in Portland Cement Concrete.
- EE. ASTM E1155 - Standard Test Method for Determining Floor Flatness and Levelness Using the F-Number System.

1.04 NOTICE

- A. Notify Architect/Structural Engineer and Structural Testing/Inspection Agency not less than 72 hours prior to placing concrete.

1.05 QUALITY ASSURANCE

- A. Structural Testing/Inspection Agency shall perform the following quality related items:
 - 1. Examine concrete in truck to verify that concrete appears properly mixed.
 - 2. Perform a slump test as deemed necessary for each concrete load. Record if water or admixtures are added to the concrete at the job site. Perform additional slump tests after job site adjustments.
 - 3. Mold four specimens per set for compressive strength testing; one set for each 75 cubic yards of each mix design placed in any one day. For each set molded, record:
 - a. Slump
 - b. Air content
 - c. Unit weight
 - d. Temperature, ambient and concrete
 - e. Location of placement
 - f. Any pertinent information, such as addition of water, addition of admixtures, etc.

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Perform one 7-day and two 28-day compressive strength tests. (Use one as a spare to be broken as directed by the Structural Engineer if compressive strengths do not appear adequate.)

- B. The ready-mixed concrete plant shall be certified for conformance with the requirements of the National Ready Mix Concrete Association.

1.06 CONCRETE MIX DESIGN

- A. Establish concrete mix design proportions in accordance with ACI 318, Chapter 5.
- B. Submit concrete mix designs. Include the following:
 1. Type and quantities of materials.
 2. Slump.
 3. Air content.
 4. Fresh unit weight.
 5. Aggregates sieve analysis.
 6. Design compressive strength.
 7. Location of placement in structure.
 8. Method of placement.
 9. Method of curing.
 10. Seven-day and 28-day compressive strengths.
- C. Concrete supplier shall submit certifications that the materials used meet applicable ASTM Specifications. Mix designs not conforming to the above will be rejected.

1.07 SLUMP

- A. Design concrete with a maximum slump of five inches.
- B. If a slump greater than five inches is desired it shall be achieved with a high-range water reducer. Design the concrete mix with a high range water reducer slump of two and one-half inches plus or minus one and one-half inches. The maximum slump after high-range water reducers are added shall be eight inches.

1.08 FRESH UNIT WEIGHT

- A. Normal weight concrete shall have a fresh unit weight of 140 to 152 pcf.
- B. Semi-Light weight concrete shall have a fresh unit weight of 120 to 125 pcf.

1.09 AIR CONTENT

- A. For normal weight concrete, no entrained air content is required in concrete placed in the foundation, or for slabs and columns with interior exposure.
- B. For normal weight concrete, entrained air content shall be five percent plus or minus one and one-half percent, unless specified otherwise.
- C. For normal weight concrete with required compressive strength equal to or greater than 5000 psi, entrained air content shall be three percent plus or minus one percent.

1.10 WATER/CEMENT RATIO

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- A. Concrete elements shall have a maximum water cement ratio of the following, unless noted otherwise.

<u>Compressive Strength</u>	<u>W/C</u>
3000 psi	0.55 UNO
4000-3500 psi	0.50 UNO

PART 2 PRODUCTS**2.01 MATERIALS**

- A. Materials designated by specific manufacturer's trade names are approved, subject to compliance with the quality and performance indicated by the manufacturer. Instructions and specifications, published by the manufacturer of such materials are included in and are a part of these specifications. Upon request, provide certification from manufacturer or supplier that materials designated by reference to ASTM and ACI standards meet the requirements of these standards.

2.02 CONCRETE STRENGTH

- A. Provide concrete strengths indicated on the Structural Drawings.

2.03 CEMENT

- A. Portland cement shall conform to ASTM C150, Type I, unless noted otherwise. Use one brand only.

2.04 AGGREGATE

- A. Fine aggregate shall conform to ASTM C33.
- B. Coarse aggregate of gravel or crushed stone shall conform to ASTM C33. Size coarse aggregate in accordance with ACI 318.

2.05 WATER

- A. Water shall be potable and free of deleterious substances in accordance with ACI 318.

2.06 AIR ENTRAINING AGENT

- A. Air entraining agent shall conform to ASTM C260.

2.07 WATER REDUCER

- A. Water reducing agent shall conform to ASTM C494.

2.08 HIGH-RANGE WATER REDUCER

- A. High-range water reducers (superplasticizers) shall conform to ASTM C494.

2.09 CHLORIDE

- A. Use no chlorides of any form in concrete.

2.10 CURING COMPOUND

- A. An acrylic cure compound with a minimum solid content of 20 percent may be used at the Contractor's option in accordance with ASTM C309, and in compliance with these specifications.

2.11 FLY ASH

- A. Fly ash shall be Class F fly ash with a loss on ignition of less than five percent or Class C fly ash with a loss on ignition of less than one percent in accordance with ASTM C618.
- B. Maximum fly ash content shall be limited to 20% of the total cementitious material weight.

2.12 GROUND GRANULATED BLAST-FURNACE SLAG (GGBFS).

- A. Ground Granulated Blast-Furnace Slag (GGBFS) shall conform to ACI 233.
- B. Maximum GGBFS content shall be limited to 50% of the total cementitious material weight. Maximum total combined GGBFS plus Flyash shall be limited to 50% of the total cementitious material weight.

2.13 ACCELERATORS

- A. Non-chloride accelerators shall conform to ASTM C494.

2.14 RETARDERS

- A. Retarders shall conform to ASTM C494.

PART 3 EXECUTION

3.01 HIGH-RANGE WATER REDUCERS

- A. High-range water reducers are to be added at dosage recommended by the manufacturer. The slump of the concrete shall be one to four inches at the time the high-range water reducers are added. Do not permit fresh concrete containing superplasticizers to come in contact with fresh concrete not containing superplasticizers.

3.02 ADDITION OF WATER AT JOB SITE

- A. Water may be added to the batch only if neither the maximum permissible water/cement ratio nor the maximum slump is exceeded.

3.03 PLACEMENT OF CONCRETE

- A. Deposit concrete as near as practical to final position. Maximum free fall shall be six feet.
- B. Do no flowing of concrete with vibrators.
- C. Place floors and slabs in accordance with ACI 302.
- D. Do not use aluminum equipment in placing and finishing concrete.
- E. Place thickened slabs for partitions integral with floor slabs.
- F. Prepare place of deposit, mix, convey, place, and cure concrete in accordance with ACI 301, ACI 304, and ACI 318. Wet forms before placing concrete.
- G. Place concrete on properly prepared granular subbase. Vapor barrier is installed above granular subgrade.

3.04 TIME LIMIT

- A. Deposit concrete within one and one-half hours after batching.

3.05 VIBRATION

- A. Consolidate concrete in accordance with ACI 301 and ACI 309.

3.06 CURING

- A. Begin curing procedures immediately following the commencement of the finishing operation.
- B. Cure concrete in accordance with ACI 308. Keep the concrete surface moist. If an acrylic curing compound is used, apply in accordance with manufacturer's recommendations to surfaces of concrete not protected for five days by formwork. Do not use curing compounds in areas to receive material that does not adhere to concrete cured with a curing compound unless the curing compound is water soluble.
- C. Moist cure concrete elements within aggressive environments as follows:
 - 1. Place burlap and polyethylene curing blankets on the surface and keep them continuously moist with sprinklers for seven days.
 - 2. In hot weather or wind conditions, prevent rapid mix water evaporation and possible plastic shrinkage cracking by using evaporation retarders or fog sprays.
 - 3. In cold weather, follow recommended procedures in ACI 306 and ACI 308.
 - 4. After the curing blankets are removed, if a sealer is not specified to be applied, spray on a two-coat application of liquid membrane curing compound. If a sealer is to be applied a curing compound is not required.

3.07 SLAB ON GRADE

- A. Concrete used in slabs on grade shall exhibit ultimate shrinkage strain no more than 0.05 percent. If tests were required to meet this criteria, concrete shrinkage tests shall be performed in accordance with ASTM C 157 on specimens moist-cured for one day. Tests shall be performed by an ACI certified technician in an ACI certified laboratory.

3.08 ENVIRONMENTAL PROVISIONS

- A. Perform cold weather concreting in accordance with ACI 306.
- B. Perform hot weather concreting in accordance with ACI 305.
- C. Protect concrete from drying and excessive temperature for the first seven days.
- D. Protect fresh concrete from wind.

3.09 CONTRACTION JOINTS

- A. Obtain Architect/Structural Engineer's approval for location of contraction joints.
- B. Do not place contraction joints in framed floors or composite slabs.
- C. Place contraction joints in slabs-on-grade with a maximum spacing of approximately 18' to form a regular grid. The long dimension of the grid shall not exceed 1.5 times the short dimension of the grid. Contraction joints may be saw cut if cut within 8 hours after placement of concrete. Saw cuts shall be a depth equal to one-fourth the slab thickness by one-eighth inch wide. Alternately, in areas to receive carpeting or wood flooring contraction joints may be provided by preformed plastic strip inserts.

3.10 CUTTING CONCRETE

- A. Obtain Architect/Structural Engineer's written approval prior to cutting concrete for installation of other work.

3.11 PATCHWORK AND REPAIRS

- A. Notify Architect/Structural Engineer of any defective areas in concrete to be patched or repaired. Repair and patch defective areas with non-shrink grout. Cut out defective areas over two inches in diameter to solid concrete, but not less than a depth of one inch. Make edges of cuts perpendicular to the concrete surface.

3.12 DEFICIENT CONCRETE COMPRESSIVE STRENGTH

- A. In the event that concrete tests indicate a 3-day, 7-day, or 28-day strength below that which was expected or specified, the Contractor with the agreement of the Architect/Engineer shall have the mix adjusted so that subsequent concrete will comply with the minimum strength requirements. The Owner may require core specimens to be taken and tested, at the Contractor's expense. If core tests fall below minimum requirements, as determined by the Architect/Engineer, the concrete in place will be deemed to be defective. This concrete shall be removed and replaced or strengthened in a manner acceptable to the Owner and Architect/ Engineer, at the Contractor's expense. Any demolition or repair of other materials or systems as a result of repair or replacement of defective concrete shall be at the Contractor's expense.

3.13 CONCRETE FINISHES

- A. Finish concrete in accordance with ACI 301, ACI 117, and ACI 302.1.
- B. Finish concrete slabs to flatness and levelness tolerances which correspond to $F_F 25/F_L 20$ minimum overall for composite of all measured values per placement and $F_F 17/F_L 15$ minimum for any individual floor section.
- C. For concrete slabs to receive wood flooring, finish to flatness and levelness tolerances which correspond to $F_F 45/F_L 30$ minimum overall for composite of all measured values per placement and $F_F 30/F_L 20$ minimum for any individual floor section.
- D. For concrete slabs to receive owner furnished equipment, finish to floor flatness and floor levelness tolerances stated in the equipment manufacturer's recommended guidelines.
- E. For shored construction, F_L values do not apply if slab is tested after shoring is removed.
- F. For unshored construction, F_L does not apply.
- G. Slabs which do not meet the flatness and levelness criteria shall be repaired or replaced.

END OF SECTION

SECTION 09 30 00

TILING

PART 1 GENERAL

1.01 SUMMARY

- A. This Section includes the following:
 - 1. Tile for floor applications.
 - 2. Quarry tile
 - 3. Glazed wall tile
 - 4. Stone thresholds installed as part of the tile installations.
 - 5. Special-purpose tile
 - 6. Cementitious backer units installed as part of the installations.
 - 7. Crack-suppression membrane for mud set tile installations.
 - 8. Tile for wall applications.
 - 9. Cementitious backer board as tile substrate.
 - 10. Stone thresholds.
 - 11. Ceramic accessories.
 - 12. Ceramic trim.

1.02 RELATED REQUIREMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.
- B. Division 1 Section "Selective Demolition" for removing existing finishes.
- C. Division 3 Section "Cast-in-Place Concrete" for monolithic slab finishes specified for tile substrates.
- D. Section 07 90 05 - Joint Sealers.
- E. Section 09 21 16 - Gypsum Board Assemblies: Installation of backer board units.
- F. Sheet A711 of the drawings - Finish Schedule and basis of design.

1.03 DEFINITIONS

- A. Module Size: Actual tile size (minor facial dimension as measured per ASTM C 499) plus joint width indicated
- B. Facial Dimension: Actual tile size (minor facial dimension as measured per ASTM C 499).

1.04 PERFORMANCE REQUIREMENTS

- A. Floor Tile Criteria: For all floor areas indicated to receive tile, provide materials which comply with the following. Submit test data to show compliance per ANSI 137.1 standards and as listed below:
 - 1. Static Coefficient of Friction: For tile installed on walkway surfaces, provide products with the following values as determined by testing identical products per ASTM C 1028:
 - a. Level Surfaces: Minimum 0.6.
 - b. Step Treads: Minimum 0.6.
 - c. Ramp Surfaces: Minimum 0.8.
 - d. Break Strength: ASTM C 648.
 - e. Bond Strength: ASTM C 482.
 - f. Abrasion Wear Resistance (Unglazed Tile): ASTM C 501.
 - g. Abrasion Wear Resistance (Glazed Tile): ASTM C 1027.
 - h. Scratch Resistance (Moh's Hardness):
 - i. Water Absorption: ASTM C 373.
 - j. Freeze/Thaw Resistance: ASTM C 1026.

SECTION 09 51 00
ACOUSTICAL CEILINGS

PART 1 GENERAL**1.01 SECTION INCLUDES**

- A. Suspended metal grid ceiling system.
- B. Acoustical units.
- C. Supplementary acoustical insulation above ceiling.

1.02 RELATED REQUIREMENTS

- A. Section 01 61 16 - Volatile Organic Compound (VOC) Content Restrictions.
- B. Section 07 90 05 - Joint Sealers: Acoustical sealant.
- C. Section 08 31 00 - Access Doors and Panels: Access panels.
- D. Section 28 31 00 - Fire Detection and Alarm: Fire alarm components in ceiling system.
- E. Section 21 13 00 - Fire-Suppression Sprinkler Systems: Sprinkler heads in ceiling system.
- F. Section 26 51 00 - Interior Lighting: Light fixtures in ceiling system.
- G. Sheet A711 of the drawings - Finish Schedule and basis of design.

1.03 REFERENCE STANDARDS

- A. ASTM C635/C635M - Standard Specification for the Manufacture, Performance, and Testing of Metal Suspension Systems for Acoustical Tile and Lay-in Panel Ceilings; 2013a.
- B. ASTM C636/C636M - Standard Practice for Installation of Metal Ceiling Suspension Systems for Acoustical Tile and Lay-in Panels; 2008.
- C. ASTM C665 - Standard Specification for Mineral-Fiber Blanket Thermal Insulation for Light Frame Construction and Manufactured Housing; 2012.
- D. 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.
- E. ASTM E1264 - Standard Classification for Acoustical Ceiling Products; 2008e1.
- F. NFPA 286 - Standard Methods of Fire Tests for Evaluating Contribution of Wall and Ceiling Interior Finish to Room Fire Growth; 2011.
- G. UL (FRD) - Fire Resistance Directory; Underwriters Laboratories Inc.; current edition.

1.04 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.

1.05 SUBMITTALS

- A. See Section 01 30 00 - Administrative Requirements, for submittal procedures.
- B. Shop Drawings: Indicate grid layout and related dimensioning.
- C. Product Data: Provide data on suspension system components.
- D. Samples: Submit two samples 12" x 12" inch in size illustrating material and finish of acoustical units.
- E. Samples: Submit two samples each, 12 inches long, of suspension system main runner.
- F. Manufacturer's Installation Instructions: Indicate special procedures.
- G. Maintenance Materials: Furnish the following for Owner's use in maintenance of project.
 - 1. See Section 01 60 00 - Product Requirements, for additional provisions.

**SECTION 09 62 23
BAMBOO FLOORING****PART 1 GENERAL****1.01 SECTION INCLUDES**

- A. Strand/Woven Bamboo Flooring;
- B. Bamboo trim and Accessory pieces.
- C. Accessories

1.02 RELATED REQUIREMENTS

- A. Section 01 35 63 – Sustainability Certification Project Requirements
- B. Section 01 61 16 - Volatile Organic Compound (VOC) Content Restrictions.
- C. Section 03 30 00 - Cast-in-Place Concrete: Restrictions on curing compounds for concrete slabs and floors.
- D. Section 09 05 61 - Common Work Results for Flooring Preparation: Independent agency testing of concrete slabs, removal of existing floor coverings, cleaning, and preparation.
- E. Sheet A711 of the drawings - Finish Schedule and basis of design.

1.03 REFERENCE STANDARDS

- A. ASTM D2047 - Standard Test Method for Specific Optical Density of Smoke Generated by Solid Materials; 2011.
- B. ASTM E648 - Standard Test Method for Critical Radiant Flux of Floor-Covering Systems Using a Radiant Heat Energy Source; 2010e1.
- C. ASTM F710 - Standard Practice for Preparing Concrete Floors to Receive Resilient Flooring; 2011.

1.04 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. Installation methods.
 - 4. Specimen warranty and warranty conditions.
 - 5. Care and maintenance instructions and recommendations.
- C. Shop Drawings: Indicate layout and installation details including dimensional plans, bamboo grain direction, fastening method, and transition accessories and details.
- D. Selection Samples
 - 1. Submit samples showing manufacturer's full range of types, grains, colors and finishes.
- E. Verification Samples:
 - 1. Submit samples at least 12 inches long, of bamboo flooring type indicated with field applied top coating applied to 1/2 of each sample and supplier identified on each sample.
- F. Test Reports: Showing compliance with specified characteristics.
- G. Sustainability Report: For flooring, submit bamboo content by weight, VOC and urea-formaldehyde content, and location of harvesting and manufacture; for adhesives, submit VOC content.
- H. LEED Credit Reports: Submit information as indicated in Section 01 35 63 – Sustainability Certification Project Requirements.
 - 1. Credit MR 6 – Rapidly Renewable Materials.
 - 2. Credit IEQ 4.1 – Low-Emitting Materials – Adhesives and Sealants.
 - 3. Credit IEQ 4.4 – Low-Emitting Materials – Composite Wood and Agrifiber Products

SECTION 09 65 00
RESILIENT FLOORING

PART 1 GENERAL**1.01 SECTION INCLUDES**

- A. Resilient sheet flooring.
- B. Resilient base.
- C. Installation accessories.

1.02 RELATED REQUIREMENTS

- A. Section 01 61 16 - Volatile Organic Compound (VOC) Content Restrictions.
- B. Section 03 30 00 - Cast-in-Place Concrete: Restrictions on curing compounds for concrete slabs and floors.
- C. Section 09 05 61 - Common Work Results for Flooring Preparation: Independent agency testing of concrete slabs, removal of existing floor coverings, cleaning, and preparation.
- D. Sheet A711 of the drawings - Finish Schedule and basis of design.

1.03 REFERENCE STANDARDS

- A. ASTM E648 - Standard Test Method for Critical Radiant Flux of Floor-Covering Systems Using a Radiant Heat Energy Source; 2010e1.
- B. ASTM F1861 - Standard Specification for Resilient Wall Base; 2008 (Reapproved 2012).
- C. ASTM F2034 - Standard Specification for Sheet Linoleum Floor Covering; 2008 (Reapproved 2013).
- D. ASTM F2195 - Standard Specification for Linoleum Floor Tile; 2013.
- E. BAAQMD 8-51 - Bay Area Air Quality Management District Regulation 8, Rule 51, Adhesive and Sealant Products; www.baaqmd.gov; 2002.
- F. RFCI (RWP) - Recommended Work Practices for Removal of Resilient Floor Coverings; Resilient Floor Covering Institute; October 2011.
- G. SCAQMD 1168 - South Coast Air Quality Management District Rule No.1168; current edition; www.aqmd.gov.

1.04 SUBMITTALS

- A. See Section 01 30 00 - Administrative Requirements, for submittal procedures.
- B. Product Data: Provide data on specified products, describing physical and performance characteristics; including sizes, patterns and colors available; and installation instructions.
- C. Shop Drawings: Indicate seaming plan.
- D. Selection Samples: Submit manufacturer's complete set of color samples for Architect's initial selection.
- E. Concrete Testing Standard: Submit a copy of ASTM F710.
- F. Certification: Prior to installation of flooring, submit written certification by flooring manufacturer and adhesive manufacturer that condition of sub-floor is acceptable.
- G. Maintenance Data: Include maintenance procedures, recommended maintenance materials, and suggested schedule for cleaning, stripping, and re-waxing.
- H. LEED Report: Report recycled content and VOC emission of flooring; VOC content of adhesives.
 - 1. For linoleum flooring, report rapidly-renewable content and urea-formaldehyde content.
- I. Maintenance Materials: Furnish the following for Owner's use in maintenance of project.
 - 1. See Section 01 60 00 - Product Requirements, for additional provisions.
 - 2. Extra Stair Materials: Quantity equivalent to 5 percent of each type and color.
- J. LEED Submittal: Documentation of recycled content and location of manufacture.

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 RELATED REQUIREMENTS

- A. Section 01 61 16 - Volatile Organic Compound (VOC) Content Restrictions.
- B. Section 01 74 19 - Construction Waste Management and Disposal: Reclamation/Recycling of new carpet scrap, new cushion scrap, removed carpet, and removed carpet cushion.
- C. Section 03 30 00 - Cast-In-Place Concrete: Restrictions on curing compounds for concrete slabs and floors to receive adhesive-applied carpet.
- D. Section 09 05 61 - Common Work Results for Flooring Preparation: Independent agency testing of concrete slabs, removal of existing floor coverings, cleaning, and preparation.
- E. Section 09 68 13 - Tile Carpeting.
- F. Sheet A711 of the drawings - Finish Schedule and basis of design.

1.03 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. ASTM F710 - Standard Practice for Preparing Concrete Floors to Receive Resilient Flooring; 2011.
- D. CRI (CIS) - Carpet Installation Standard; Carpet and Rug Institute; 2009.
- E. 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.

1.04 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 24 x 24 inch in size illustrating color and pattern for each carpet and cushion material specified.
- E. LEED Report: Submit data documenting VOC content of carpet, cushion, and adhesives; copy of current CRI Approved Products Listing is acceptable.
- F. Manufacturer's Installation Instructions: Indicate special procedures.
- G. Maintenance Data: Include maintenance procedures, recommended maintenance materials, and suggested schedule for cleaning.
- H. Maintenance Materials: Furnish the following for Owner's use in maintenance of project.
 - 1. See Section 01 60 00 - Product Requirements, for additional requirements.
 - 2. Extra Carpet: ____ sq ft of each type, color, and pattern installed.

SECTION 09 68 13

TILE CARPETING

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Carpet tile, fully adhered.
- B. Removal of existing carpet tile.

1.02 RELATED REQUIREMENTS

- A. Section 03 30 00 - Cast-in-Place Concrete: Restrictions on curing compounds for concrete slabs and floors.
- B. Section 09 05 61 - Common Work Results for Flooring Preparation: Independent agency testing of concrete slabs, removal of existing floor coverings, cleaning, and preparation.
- C. Section 09 68 00 - Carpeting: Broadloom carpet.
- D. Sheet A711 of the drawings - Finish Schedule and basis of design.

1.03 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. CRI (GLA) - Green Label Testing Program - Approved Adhesive Products; Carpet and Rug Institute; Current Edition.
- E. CRI (GLP) - Green Label Plus Carpet Testing Program - Approved Products; Carpet and Rug Institute; Current Edition.
- F. 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.

1.04 SUBMITTALS

- A. See Section 01 30 00 - Administrative Requirements, for submittal procedures.
- B. Shop Drawings: Indicate layout of joints, direction of carpet pile, and location of edge moldings.
- 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 carpet tiles illustrating color and pattern design for each carpet color selected.
- E. LEED Report: Submit data documenting VOC content of carpet tile and adhesives; copy of current CRI Approved Products Listing is acceptable.
- F. Manufacturer's Installation Instructions: Indicate special procedures.
- G. Maintenance Data: Include maintenance procedures, recommended maintenance materials, and suggested schedule for cleaning.
- H. Maintenance Materials: Furnish the following for Owner's use in maintenance of project.
 - 1. See Section 01 60 00 - Product Requirements, for additional provisions.
 - 2. Extra Carpet Tiles: Quantity equal to 5 percent of total installed of each color and pattern installed.

1.05 QUALITY ASSURANCE

- A. Manufacturer Qualifications: Company specializing in manufacturing specified carpet tile with minimum three years documented experience.
- B. Installer Qualifications: Company specializing in installing carpet with minimum 5 years experience.

SECTION 10 41 16
EMERGENCY KEY CABINETS

PART 1 GENERAL**1.01 GENERAL PROVISIONS**

- A. All Construction Documents and general provisions of the Agreement Between Owner and Contactor, including Division 00 General Conditions of the Contract for Construction Supplementary Conditions and Division 01 Specification Sections, apply to this Section.
- B. Carefully review and examine all other Contract Documents as well as field conditions for requirements therein affecting the work of this Section. Furthermore, coordinate and sequence the work of this Section with all other trades affected.

1.02 SUMMARY

- A. Furnish and install Exterior Emergency Key Cabinets and pertinent accessories as indicated on Drawings and/or as specified in this Section.

1.03 RELATED REQUIREMENTS

- A. Section 01 10 00 - Summary: Contract descriptions, description of alterations work, work by others, future work, occupancy conditions, use of site and premises, work sequence.
- B. Section 01 78 00 - Closeout Submittals: Project record documents, operation and maintenance (O&M) data, warranties and bonds.
- C. Division 5 - Metals

1.04 SUBMITTALS

- A. See Section 01 30 00 - Administrative Requirements, for submittal procedures.
- B. Product Data: Provide complete manufacturer's product data consisting of product description and specifications, test data and technical characteristics, safety precautions, preparations, and installation instructions.
 - 1. Include safety precautions, preparations and installation instructions, maintenance instructions and other pertinent technical information required for product use and functionalities.
- C. Shop Drawings: Indicate Submit complete shop drawings of all work of this Section, showing all pertinent details of construction and installation.
- D. Samples: Submit samples of all finish materials specified under this Section. Size and form of samples shall be as directed by Architect.
- E. Do not order materials or begin fabrication or installation until Architect's approval of submittals has been obtained.

1.05 WARRANTY

- A. See Section 01 78 00 - Closeout Submittals, for additional warranty requirements.
- B. In addition to the specific warranty requirements of the Contract, provide in the Owner's name the standard written manufacturer's warranty of all products furnished and installed under this Section where such warranties are offered in the manufacturer's published product data. All these warranties shall be in addition to, and not in lieu of, other liabilities which the Contractor may have by law or other provisions of the Contract Documents.

PART 2 PRODUCTS**2.01 EXTERIOR EMERGENCY KEY CABINETS**

- A. Furnish and install recessed mounted exterior emergency key cabinets equivalent to Rapid Entry System "Hinged Door Series 3200 Knox-Box" as manufactured by Knox Co., Phoenix, AZ, on exterior walls adjacent to the front entrances as directed by local Fire Department.
 - 1. Exterior emergency key cabinets shall be approximately 4"H x 5" W x 3-3/4" D capable of holding up to 10 keys and access cards in interior compartment, fabricated of heavy duty drill-resistant 1/4" solid steel housing 100% welded construction.

2. High security UL listed double-action rotating tumblers and hardened steel pins accessed by a biased cut key. Lock shall have 1/8" thick stainless steel dust cover with tamper seal mounting capability. Provide 4 keys to each cabinet master-keyed to the local Fire Department keying system.
 3. Dead bar protected stainless steel hinge.
 4. 1/2" thick steel door with three-bolt latch and weather resistant door gasket. Hinged door shall allow single hand operation
 5. Provide UL listed alarm tamper switch.
 6. Provide matching recess mounting kits (RMK) with 7" x 7" face flange for recess mounting into the concrete or masonry walls.
- B. Finish Color: black.

PART 3 EXECUTION**3.01 EXAMINATION**

- A. Inspect all surfaces and verify that they are in proper condition to receive the work of this Section. Verify that field measurements are as indicated on reviewed and approved shop drawings.
- B. Coordinate device mounting locations with authorities having jurisdiction and obtain approval in writing prior to installation.
 1. Exterior emergency key cabinets mounting locations shall be as directed and approved by the local Fire Department.
- C.

3.02 INSTALLATION

- A. All items under this Section which are specified to be installed as work of this Section shall be installed in strict accordance with the approved shop drawings and the manufacturer's printed instructions and recommendations, required to be submitted as specified hereinabove.

END OF SECTION

5. Verify rail position and level; anchor to structural floor system with anchor type and spacings indicated on approved shop drawings.
- B. Shelving Units Installation: See section 1.5, B and C in this document.
 1. General: Follow layout and details shown on approved shop drawings and manufacturer's printed installation instructions. Position units level, plumb; at proper location relative to adjoining units and related work.
 2. Carriages:
 - a. Place movable carriages on rails. Ensure that all wheels track properly and centering wheels are properly seated on centering rails. Fasten multiple carriage units together to form single movable base where required.
 - b. Position fixed carriage units to align with movable units; make final leveling adjustments with leveling screws.
 3. Shelving Units:
 - a. Permanently fasten shelving units to fixed and movable carriages with vibration-proof fasteners.
 - b. Stabilize shelving units following manufacturer's written instructions. Reinforce shelving units to withstand the stress of movement where required and specified.

3.03 FIELD QUALITY CONTROL

- A. Verify shelving unit alignment and plumb after installation. Correct if required following manufacturer's instructions.
- B. Remove components which are chipped, scratched, or otherwise damaged and which do not match adjoining work. Replace with new, undamaged, matching units.

3.04 ADJUSTING

- A. Adjust components and accessories to provide smoothly operating, visually acceptable installation.

3.05 CLEANING

- A. Immediately upon completion of mobile shelving installation, clear components and surfaces. Remove surplus materials, rubbish and debris resulting from mobile shelving installation upon completion of work and leave areas of installation in neat, clean condition.

3.06 DEMONSTRATION/TRAINING

- A. Schedule and conduct demonstration of installed equipment and features with Owner's personnel.
- B. Schedule and conduct maintenance training with Owner's maintenance personnel. Training session should include lecture and demonstration of all maintenance and repair procedures that end user personnel would normally perform.

3.07 PROTECTION

- A. Advise Owner of additional protection needed to ensure that system will be without damage or deterioration at time of substantial completion.

3.08 SPECIAL NOTES:

- A. L1 Existing system
 1. L1 shelving shall be at the 1st floor of Central Library. Contractor to coordinate schedule with Owner and pick retrieve L1 shelving from 1st floor of Central Library and transport to factory or AARL for work as described herein.
- B. L2 Existing system
 1. Disassemble, pack, move out of the building, store for up to twelve months, move back into the building, and reassemble eight complete ranges of shelving.
 2. Disassemble, move, and reassemble on L3 one 44.5" platform with Delta archive drawers and shelving.
 3. Disassemble, move, and reassemble on L3 one 42.5" platform with Delta cassette drawers and shelving. SSQL Top, Bottom and Middle shelves with 5 levels of Oblique filing systems.
 4. Move from dock and reassemble 15 complete ranges of shelving (all originally from L1).
- C. L3 Existing system

SECTION 12 15 00
ART HANGING AND DISPLAY SYSTEMS

PART 1 GENERAL**1.01 SUMMARY**

- A. Section includes materials required for the Click Rail System to provide a complete system for hanging informational, directional, art and regulatory notices, with rigid track that does not bend. Review the wall segment that is to receive the track and confirm that the wall is linear.
- B. The system to be flush installed along entire perimeter of wall(s) in room designated to receive system.
- C. When using cables, the system may be used with a single overhead track and suspended cables, or in conjunction with a matched lower track to hold the cables in tension.

1.02 SUBMITTALS

- A. Product Data: Indicate system, material type, color, composition, thickness, and installation procedure.
- B. Samples: The party responsible for delivering the product to the job site, installer or supplier, must present one (1) sample of each of the components for the system to be installed to the architect or owner representative for verification. The physical sample is required at the job site to determine if the components of the system meet the intent of the specification.

1.03 QUALITY ASSURANCE

- A. Conduct a Pre-Installation Conference on site with the Design Professional, General Contractor and Installer prior to commencing installation. The components of the art Hanging Systems have various weight tolerances. Once the weight is known, the components needed to carry the weight will be identified.
- B. Stainless Steel Cables are 0.071-inches (1.8mm); Rated Strength: 45lbs (20.5Kg)

1.04 WARRANTY

- A. Materials and Workmanship for Tracks: One (1) year (the "Limited Warranty Period") from the date of purchase
- B. Materials and Workmanship for Cables: One (1) year (the "Limited Warranty Period") from the date of purchase
- C. Materials and Workmanship for Hooks: One (1) year (the "Limited Warranty Period") from the date of purchase
- D. Materials and Workmanship for Cable Clamps: One (1) year (the "Limited Warranty Period") from the date of purchase.

PART 2 – PRODUCTS**2.01 MANUFACTURERS**

- A. Systematic Art Incorporated; New York, New York; 212-614-3233; www.wholesale@systematicart.com; Product: Click-Track Classic
- B. Nova Display, Inc.; 1626 Piner Road, Santa Rosa, CA. 95403; sales@novadisplay.com; Product: Cable Hanging System
- C. Gallery Systems Art Displays; 800-460-8730; inquiries@gallerysystem.com; Product: Galleryone System
- D. AS Hanging Systems, US Distribution Center, 20 Gateway Dr #300, Plattsburgh, NY 12901. Canadian Distribution Center, 3600 Matte Blvd., Unit L, Brossard QC J4Y 2Z2 Canada. Toll free: 866-935-6949, Phone: 450-619-7999, info@ashanging.com.

2.02 PRODUCTS

- A. Click Rail System: For quickly, discreetly, and securely hanging art, photography, employee safety posters and other display notices. The Click Rail Hanging System shall be satin anodized finish. The wall track shall have 45lb capacity stainless steel cables.
- B. Wall Track: Aluminum Silver, satin anodized,
- C. Wall Track End Cap: Plastic Grey.

- D. Wall Track Corner Connectors: Plastic Grey.
- E. Cable & Cord: Grip-End Stainless Steel Cable. One cable and hook every 2'-0".
 - 1. Provide 120 in length of cable.
- F. Hooks: [Utility/Special Purpose], [Utility/Special Purpose Large], [Self-Gripping (Small)], [Secure Self-Gripping (large)], [Multi-Purpose], [Secure Aluminum Frame (2 Reg'd/frame)], [Mini].
- G. Cable Clamp (Galv. & SS cables only): [Single Sided], [Double Sided].
- H. Sliding Hook: Bright Nickel
- I. Cable Stop.
- J. Provide fasteners suitable for installation in wall substrate. Plastic screw anchors are not acceptable.

PART 3 – EXECUTION

3.01 INSTALLATION

- A. INSTALLATION shall be as required for each system in strict accordance with latest edition of MANUFACTURER'S Installation Guide. A minimum of two (2) complete copies of the Installation Guide shall be on the project site at all times.
- B. The wall surface and its substrate determine the type of fasteners used for the particular application. It is the responsibility of the installer to select the correct fastener for the particular installation. Failure to do so may cause property damage or personal injury.
- C. Provide adequate cable length. Additional cable length can be coiled and placed behind the lowest frame to avoid field cutting. Extra cable length may be coiled and hung (hidden) behind presented objects. If a cable length does require to be field trimmed, it should be trimmed according to published guidelines.
 - 1. Most wall-hung objects are positioned so the center is about 5 feet above the adjacent floor surface. Cable length would then equal the track height from the adjacent floor minus 5 feet.

END OF SECTION

- J. Products Requiring Electrical Connection: Listed and classified by Underwriters Laboratories Inc. as suitable for the purpose specified and indicated.

1.07 ALLOWANCE

- A. Allow \$220,000 for modernization of controls, drives wiring lamps and fixtures relative to two existing traction elevators.
- B. Allow \$30,000 for renovation of cab interior and ceilings.

PART 2 PRODUCTS

2.01 MANUFACTURERS

- A. Other Acceptable Manufacturers:
1. ThyssenKrupp Elevator: www.thyssenkruppelevator.com.
 2. Otis Elevator Co: www.otis.com.
 3. Schindler Elevator Corp: www.us.schindler.com.
 4. Substitutions: See Section 01 60 00 - Product Requirements.
- B. All components to be manufactured by same entity, unless otherwise indicated.

2.02 ELEVATORS

- A. Elevator New hydraulic elevator to be used as service elevator: Passenger, hydraulic with cylinder in buried casing.
1. Additional Service Controls: In addition, provide:
 - a. Limited access service.
 2. Cab Design: Model Seville by ThyssenKrupp.
 3. Hoistway Doors and Frames: Stainless steel.
 4. Cab Height: 95 inches.
 5. Hoistway and Cab Entrance Frame Opening Size: as indicated inches.
 6. Door Type: Double leaf.
 7. Door Operation: Side opening.
 8. Rated Net Capacity: 3,500 lbs.
 9. Rated Speed: 150 ft/min.
 10. Nominal Platform Size: 6'-8" x 5'-5" inches.
 11. Travel Distance: As indicated on drawings.
 12. Number of Stops: 4.
 13. Hydraulic Motor and Pump Location: Adjacent to hoistway.
 14. Pit depth: 4'-0".

2.03 CONTROLS

- A. Elevator Controls: Provide landing buttons and hall lanterns.
- B. Door Controls:
1. Program door control to open doors automatically when car arrives at floor.
 2. Render "Door Close" button inoperative when car is standing at dispatching terminal with doors open.
 3. If doors are prevented from closing for approximately ten seconds because of an obstruction, automatically disconnect door reopening devices, close doors more slowly until obstruction is cleared. Sound buzzer.
 4. Door Safety Devices: Moveable, retractable safety edges, quiet in operation; equip with photo-electric light rays.
- C. Landing Buttons: Stainless steel type, one for originating UP and one for originating DOWN calls, one button only at terminating landings; marked with arrows.
- D. Landing Position Indicators: Illuminating white.
- E. Car Direction Indicators: Illuminating white.
- F. Provide "Firefighter's Operation" in accordance with applicable code. Designated Landing: 1st floor.

SECTION 23 60 00

EQUIPMENT

PART 1 GENERAL

1.01 DESCRIPTION

- A. General provisions and other HVAC systems are specified in other Sections of Division 23.
- B. This Section covers HVAC systems and equipment.
- C. Testing, adjusting and balancing is specified in Section 23 00 95, Testing, Adjusting and Balancing.
- D. Performance verification is specified in Section 23 00 90, HVAC Performance Verification. This Section includes responsibilities and obligations in support of performance verification specified therein, and commissioning specified in Section 01 91 13, General Commissioning Requirements, and Section 23 08 00, Mechanical Systems Commissioning.

1.02 QUALITY ASSURANCE

- A. Conform to the following:
 - 1. International Energy Conservation Code-2009 with Georgia State Amendments-2012.
 - 2. International Mechanical Code-2009 with Georgia State Amendments-2012.
 - 3. Georgia Laws Regulating Boilers and Pressure Vessels-2009.
 - 4. NFPA 70-2011.
 - 5. NFPA 90A-2012.
- B. Pressure/temperature ratings of components and accessories shall meet or exceed design conditions for the system in which they are installed. Refer to Section 23 10 00, Piping, Valves and Accessories, and requirements specified herein.
- C. Provide a complete parts and labor warranty, including refrigerants and lubricants, for 1 year after date of substantial completion, for the following equipment:
 - 1. Air-cooled chillers.
 - 2. Energy recovery units.
- D. Gas systems shall conform to AGA requirements, NFPA 54-2012, International Fuel Gas Code-2012, -2006 with Georgia State Amendments-2012, and rules of the Atlanta Gas Company.
- E. Furnish evidence that the boiler manufacturer or his representative maintains a qualified local service organization, including spare parts, and is available for competent service within 24 hours after notification.

PART 2 PRODUCTS

2.01 COILS

- A. Copper tubes and nonferrous fins with belled collars mechanically bonded to the tubes.
- B. Multirow hot water coils: designed for parallel flow of water to air.
- C. Supply and return connections shall be on the same end.
- D. Performance shall be in accordance with AHRI 410-2001 (with Addendum).
- E. Minimum working pressure rating shall be equal to that specified herein for the piping system in which the coil is installed. Coils shall be tested at the rated working pressure plus 50%.

2.02 ELECTRONIC STEAM HUMIDIFIERS

- A. Electronically controlled, self-contained type, UL listed, designed to generate steam from domestic water. Humidifiers shall have full modulating control to provide 25% to 100% capacity. Capacity shall be fully field adjustable.
- B. Steam generator electrodes and cylinders shall be easily serviced and replaced. Generators shall each have a water drainage system and a high water cutoff.
- C. Humidifiers shall incorporate a self-regulating automatic drain cycle (1 drain valve for each generator) controlled by water conductivity. The automatic drain cycle shall have adjustable drain duration and drain interval cycles.
- D. Provide a means of tempering drain water to below 140°F during automatic drain cycle.

- E. Humidifier fill lines shall have an air gap and a water seal between the fill cup and the generator.
- F. Humidifiers shall be provided with stainless steel dispersion tubes and reinforced rubber hoses.
- G. Manufacturer: Armstrong, DGH, Hermidifier, Nortec, or Walton.

2.03 AIR-COOLED CHILLERS

- A. Packaged, air-cooled type, designed and constructed in accordance with ASHRAE 15-2010, complete with compressors, motors, evaporators, condensers, insulation, controls, mounting frame, enclosure, protective louvers, and associated equipment
- B. Rating certification: capacity rating shall be in accordance with AHRI 550/590-2011 Addendum 1. A direct copy of the AHRI computer selection printout at the full load design condition shall be provided to the Architect upon request.
- C. Compressors: shall be one of the following types:
 - 1. Scroll hermetic type, including centrifugal oil pump. Compressors shall start unloaded.
 - 2. Rotary screw semi-hermetic type, complete with positive pressure oil lubrication system, oil heater, and automatic capacity reduction system with automatic unloading on start-up. Compressors shall fully modulate over the entire capacity range.
- D. Evaporators: covered with 2" thick flexible elastomeric sheet, vapor barrier insulation; protected against freeze-up by a thermostat-controlled temperature maintenance cable wrapped around the shell under the insulation. Fouling factor shall be 0.0001 ft² °F·h/Btu. Water velocity shall not exceed 10 fps.
- E. Refrigerant circuits: high side pressure relief valve, liquid line isolation valve, filter drier, moisture indicating sight glass, liquid line solenoid valves, and thermal expansion valves.
- F. Condensers: vertical discharge with safety guard. Coils shall have copper tubes and aluminum fins.
- G. Starters: full voltage magnetic type, with circuit breakers, overload relay in each phase leg, and phase failure and low voltage protection. Circuit breakers shall have a minimum AIC rating equal to or greater than the short circuit capacity shown for the panelboard, switchboard, or switchgear immediately upstream between the starter and the source, as indicated on the Electrical Drawings.
- H. Controls: positive acting timer to prevent short-cycling of compressors, high and low pressurestats, multiple-step water temperature controller, chilled water safety thermostat, field power and control circuit terminal blocks, fuses, control relays, and oil safety switch. Capacity controls shall maintain leaving chilled water temperature.
 - 1. Provide BACnet communication card for full integration with the building DDC system.
 - 2. Evaporator differential pressure switches: opposed-diaphragm type, with magnetically actuated switches, weather-sealed enclosure, and isolation and null valves, selected to operate at the minimum flow differential and to withstand 1.25 times the maximum flow differential. Maximum range shall correspond to 0 psid to 15 psid, and switch shall operate in the top 80% of the range. Proof pressure shall exceed the static pressure of the installed system. Switch shall not drop out at high differential pressures. Provide transmitter with 4-20 mA, 0-5 V, and RS-232 outputs for control system connections.
 - a. Manufacturer: Orange Research 1533 DGT series.
- I. Manufacturer: Bohn, Carrier, McQuay, Trane, or York.

2.04 TERMINAL UNITS

- A. Casings:
 - 1. Minimum 24 gauge galvanized steel.
 - 2. Acoustical lining: minimum 0.5" thick, 1.5 pcf density coated fiberglass. Lining shall meet erosion test method described in UL 181-2005 and shall have a flame spread rating of not more than 25 and a smoke developed rating of not more than 50 in accordance with NFPA 90A-2012.
 - 3. Access doors: sealed, flush type for access to internal parts for service or maintenance.
 - 4. Enclosure: removable type for control components.
 - 5. Casing leakage rate of less than 3% at 4" wg.
 - 6. Inlet velocity shall not exceed 2200 fpm.
- B. Control Motors:
 - 1. Factory-installed on units by unit manufacturer.

2. Coordinated with automatic control system manufacturer; see Section 23 80 00, Automatic Temperature Controls.
- C. Airflow sensors: averaging multipoint type, with taps for field calibration, minimum $\pm 5\%$ accuracy with 90° elbow at inlet.
- D. Volume Regulators:
 1. Factory preset: minimum and maximum air quantity. Air volumes and unit size shall be indicated on the regulator.
 2. Gauge taps and calibrated means of adjustment to permit field adjustment of air quantities without unit disassembly.
 3. Pressure independent, capable of maintaining constant volume, $\pm 5\%$, up to $4''$ wg inlet air pressure.
 4. Factory-mounted.
 5. Removable.
- E. Depth of units: $20''$ maximum.
- F. Moving parts designed for minimum of 300000 cycles.
- G. Heating coils: hot water type, as specified in Paragraph 2.01, Coils.
- H. Variable Volume Units:
 1. Complete with:
 - a. Air valve assembly.
 - b. Variable air volume from maximum of 100% to minimum of approximately 0%.
- I. Manufacturer: Carnes, Carrier, Johnson Controls YVS, Krueger, Metal*Aire, Nailor, Price, Titus ESV, TQS or TQP, Trane, or Tuttle and Bailey.

2.05 AIR HANDLING UNITS

- A. General, except as otherwise specified herein:
 1. Complete with fan, motor, drive, coils, access sections, discharge plenum, and filters housed in a finished solid double-wall casing with thermal insulation and drain pan. Functional components shall be accessible for inspection and maintenance through hinged, solid double-wall access doors in each section. Piping connections shall extend through the casing. Unit performance for standard and modular units shall be certified in accordance with AHRI 430-2009.
 2. Fans:
 - a. Tested in accordance with ASHRAE 51/AMCA 210-2007.
 - b. Statically and dynamically balanced. Fans with variable frequency drives shall be dynamically balanced throughout the complete speed range.
 - c. Bearings: pillow block or flange type with L_{10} life of 80000 hours at the peak operating condition. Extend grease leads to allow lubrication during inspection on the access side.
 - d. For housed centrifugal fans in draw-through units, fan wheel rotation shall be in the same direction as flow in elbows installed within 3 duct diameters of the fan discharge, where discharge from the elbow is perpendicular to the fan shaft.
 3. Cooling coils: chilled water type, as specified in Paragraph 2.01, Coils.
 4. Heating coils: hot water type, as specified in Paragraph 2.01, Coils.
 5. Filters: pleated and cartridge type, as specified in Section 23 70 00, Air Distribution.
 6. Internal vibration isolation: at Contractor's option, internal vibration isolators may be provided in lieu of external isolators. Fan and motor shall be mounted on a common steel vibration base. Fans shall have a flexible connection to the casing. Internal vibration isolators shall be as specified in Section 23 00 10, HVAC General, and as indicated on the Drawings.
 7. Drives: V-belt type, as specified in Section 23 70 00, Air Distribution.
 8. Motors: as specified in Section 23 00 10, HVAC General.
 9. Variable frequency drives: as specified in Section 23 00 10, HVAC General.
 10. Control dampers: as specified in Section 23 80 00, Automatic Temperature Controls.
 11. Drain pans: double-wall stainless steel construction with insulation sandwiched between inner and outer pans. Corners shall be welded. Pans shall be pitched toward drain outlet. Units with stacked coils shall include a secondary drain pan under each coil with drain piping to main pan.

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12. Double-wall casing insulation: 2" thick spray injected foam with a maximum K-value of 0.167 Btu·in/(h·ft²·°F) at 75° F. Insulation shall have a composite flame spread rating of not more than 25 and a smoke developed rating of not more than 50 in accordance with NFPA 90A-2012.

B. Draw-Through Type Units:

1. Manufacturer: Carrier 39, Dunham-Bush, Johnson Controls/York Solution, McQuay, Temtrol, or Trane MCC.

2.06 BLOWER-COIL UNITS

- A. Horizontal draw-through type, with mixing box, cabinet, and accessories as indicated on the Drawings.
- B. Complete with coils, galvanized steel chassis, insulated casing, insulated drain pan, filters, manual air vent, disconnect switch, and one or more centrifugal fans. Control valves shall be capable of full closure against a 50 psig head.
- C. Cooling coils: chilled water type, as specified in Paragraph 2.01, Coils.
- D. Heating coils: hot water type, as specified in Paragraph 2.01, Coils.
- E. Filters: throw away type, as specified in Section 23 70 00, Air Distribution.
- F. Motors: as specified in Section 23 00 10, HVAC General.
- G. Drives: adjustable V-belt type, sized to transmit 150% of motor size.
- H. Manufacturer: Carrier, Johnson Controls, McQuay, or Trane.

2.07 FAN-COIL UNITS

- A. Horizontal concealed blow-through type, with cabinet and accessories as indicated on the Drawings.
- B. Complete with coils, galvanized steel chassis, insulated casing, insulated drain pan, filters, manual air vent, disconnect switch, and one or more centrifugal fans. Control valves shall be capable of full closure against a 50 psig head.
- C. Cooling coils: chilled water type, as specified in Paragraph 2.01, Coils.
- D. Heating coils: hot water type, as specified in Paragraph 2.01, Coils.
- E. Filters: throw away type, as specified in Section 23 70 00, Air Distribution.
- F. Motors: as specified in Section 23 00 10, HVAC General.
- G. Drives: adjustable V-belt type, sized to transmit 150% of motor size.
- H. Manufacturer: Carrier 42CA, Dunham-Bush CB, International CHY, Johnson Controls FHP, McQuay FTSC, or Trane FCD.

2.08 SPLIT SYSTEM PACKAGED HEAT PUMPS

- A. Outside units: complete with hermetic or semi-hermetic compressors, expansion and check valves, changeover valve, defrost control system, compressor sump heaters, low ambient controls, refrigerant line filter-driers, refrigerant pressure taps, and condenser fans. For unit sizes larger than 5 tons, coils shall have copper tubes. Units shall include compressor safeties, internal overload protection, internal pressure relief valve and factory-wired controls with 24 V control transformer and weatherproof electrical enclosure. Units shall be furnished with factory refrigerant precharge. Units shall be UL listed and rated in accordance with AHRI 210/240-2008 Addendum 1.
- B. Indoor units: insulated cabinet type designed for horizontal airflow, end return and side access. Units shall contain multispeed centrifugal fans, direct-expansion coil, expansion valve, check valve, condensate drain pan, filters and filter rack, and supplemental electric heat compartment. Coils shall have copper tubes.
- C. Filters: throw away type, as specified in Section 23 70 00, Air Distribution.
- D. Heating coils: electric type.
- E. Controls: automatic changeover heating/cooling thermostat with 2-stage heating control, and thermostat subbase.
 - 1. Heating coil controls shall be incorporated with heat pump controls. Coil shall be energized as second stage heat when reverse cycle heating is inadequate, and when the unit is in the defrost cycle. Control relays, and contactors shall be provided.
- F. Manufacturer: Carrier, Johnson Controls/York, or Trane.

2.09 SPLIT SYSTEM AIR CONDITIONING UNITS

- A. **Condensing units: complete with hermetic** or semi-hermetic compressors, compressor sump heaters, refrigerant line filter-driers, low ambient controls, refrigerant pressure taps, and condenser fans. For unit sizes larger than 5 tons, coils shall have copper tubes. Units shall include compressor safeties, internal overload protection, internal pressure relief valve and factory-wired controls with 24 V control transformer and weatherproof electrical enclosure. Units shall be furnished with factory refrigerant precharge. Units shall be UL listed and rated in accordance with AHRI 210/240-2008 Addendum 1.
- B. Indoor units: insulated cabinet type designed for horizontal airflow, end return and side access. Units shall contain multispeed centrifugal fans, direct-expansion coil, expansion valve, condensate drain pan, filters and filter rack, and electric heat. Coils shall have copper tubes.
- C. Filters: throw away type, as specified in Section 23 70 00, Air Distribution.
- D. Heating coils: electric type, as specified in Paragraph 2.16, Electric Heating Coils.
- E. Controls: automatic changeover heating/cooling thermostat with 2-stage heating control, and thermostat subbase. Heating coil controls shall be incorporated with unit controls. Control relays, and contactors shall be provided.
- F. Manufacturer: Carrier, Johnson Controls/York, Lennox, or Trane.

2.10 DUCTLESS SPLIT SYSTEMS

- A. Systems shall be commercial grade equipment, complete with an outdoor condensing unit, indoor fan-coil unit, refrigerant piping, and controls. Units shall be rated in accordance with AHRI 210/240-2008 Addendum 1. Units shall be factory-charged with refrigerant R-410A. Systems shall operate as cooling only systems as indicated on the Drawings.
- B. Outdoor condensing units: factory-assembled, complete with compressors, condenser fans, condenser coils, motors, controls, electronic expansion valves, solenoid valves, distribution headers, capillaries, filters, shut off valves, oil separators, service ports, refrigerant regulators, and controls.
 - 1. Compressors shall be variable speed scroll type. Compressor speed shall be varied between 5% to 100% speed in response to load variation. Compressors shall be equipped with crankcase heaters, high pressure safety switches, and internal thermal overload protection.
 - 2. Condenser fans shall be propeller type with variable speed digitally commutating motors.
 - 3. Condenser coils shall have copper tubes, and aluminum fins.
 - 4. Controls: microprocessor-based.
 - 5. Electric connections: single point 208 V, 3-phase.
- C. Indoor Fan-Coil Units:
 - 1. Ductless wall-mounted type, factory-assembled complete with cabinet, fan, coil, air filter, condensate pan, integral condensate pump, and controls. Units shall be provided with supply and return grilles and shall be designed for installation on wall in a conditioned space.
 - 2. Filters: throw away type, as specified in Section 23 70 00, Air Distribution.
 - 3. Controls: microprocessor-based.
 - 4. Electric connections: each fan-coil unit shall be single point connection.
- D. Refrigerant Piping:
 - 1. As specified in Section 23 10 00, Piping, Valves and Accessories.
 - 2. Piping joints and headers shall be provided by the system manufacturer in order to provide balanced refrigerant flow, and to provide specified capacity and performance.
- E. Wall-mounted space temperature sensors: provide for all indoor fan-coil units with the following features:
 - 1. Thermistor type temperature sensor.
 - 2. Setpoint adjustment buttons.
 - 3. Backlit LCD display in English.
 - 4. Display of sensed room and set point temperatures.
 - 5. Cooling set point range limits.
 - 6. Buttons shall be capable of being disabled by maintenance personnel.
- F. Manufacturer: Carrier, Daikin, Friedrich, JCI/York, LG, Mitsubishi, or Panasonic.

2.11 WATER TREATMENT SYSTEMS

- A. Chilled and Hot Water Treatment Systems:
1. Bypass chemical feeders: steel construction, 5 gal capacity, with a pressure rating of 125 psig. Tank shall have inlet, outlet, 25 micron stainless steel mesh filter, and fill cap with minimum 3.5" opening.
 2. Supplier: Anderson, Garratt-Callahan, GE Water and Process Technologies, Nalco, National Chemical, Superior, or Technical Specialties.

2.12 PUMPS

- A. End-suction, split-case back pull-out type, bronze-fitted, flexible-coupled, with bronze-sleeved or stainless steel shafts, mechanical seals designed for the pump service, bronze casing wear rings, shaft and coupling guard, and one-piece bronze impellers of nonoverloading type so motor nameplate rating shall not be exceeded at any point on the pump curve up to 125% of the flow indicated on the Drawings. Impellers shall be statically, dynamically, and hydraulically balanced. Casings shall have drilled and tapped vent and drain holes and air vent cocks.
1. Each pump and motor shall be mounted on a common base of welded steel construction with grout holes.
 2. Pumps shall be designed for a working pressure of 175 psig and a maximum fluid temperature of 240°F.
 3. Bearings: ball type, grease lubricated, with fittings, designed for in-service lubrication or sealed for life, rated for a L₁₀ life of 50000 hours at the maximum load scheduled on the Drawings.
 4. Motors: as specified in Section 23 00 10, HVAC General.
 5. Impeller diameter shall not exceed 85% of volute cutwater diameter for single-volute design and 92% for double-volute design.
 6. For chilled water applications: galvanized drain pan, 16 gauge minimum with a 0.5" drain coupling.
 7. Manufacturer: Armstrong, Aurora, Bell & Gossett, PACO, Patterson, Taco, or Weinman.
- B. Inline centrifugal close-coupled back pull-out type, bronze-fitted, with bronze-sleeved or stainless steel shafts, mechanical seals designed for the pump service, bronze casing wear rings, and one-piece bronze impellers of the nonoverloading type so motor nameplate rating will not be exceeded at any point on the pump curve up to 125% of the flow indicated on the Drawings. Impellers shall be statically, dynamically, and hydraulically balanced. Casings shall have drilled and tapped vent and drain holes.
1. Pumps shall be designed for a working pressure of 125 psig and a maximum fluid temperature of 250°F.
 2. Motors: as specified in Section 23 00 10, HVAC General.
 3. Impeller diameter shall not exceed 85% of volute cutwater diameter.
 4. For chilled water applications: galvanized drain pan, 16 gauge minimum with a 0.5" drain coupling.
 5. Manufacturer: Armstrong 4380, Aurora 380, Bell & Gossett 80, Grundfos, MEPCO RC, PACO VL, Peerless PV, or Taco KV.

2.13 BOILERS

- A. Condensing Boilers:
1. Gas-fired, hot water forced draft type, a standard catalogued product, with the combustion chamber and heat exchanger assembly constructed of high stainless steel, and lower temperature surfaces exposed to the combustion process constructed of PVC or stainless steel material to resist corrosion.
 2. Boilers shall be designed, constructed, certified, stamped, and trimmed in accordance with the ASME BPVC "H" stamp for 150 psig hot water working pressure. Boilers shall be certified and listed in accordance with ANSI Z21.13-2010/CSA 4.9-2010. Boilers shall comply with the energy efficiency requirements of ASHRAE 90.1-2010 Standard and the minimum efficiency requirements of ASHRAE 103-2007 Standard. They shall operate at a minimum annual fuel utilization efficiency of 93% and shall operate at 98% thermal efficiency with return water temperature at 100°F or below. The boiler's thermal efficiency shall be verified through third party testing by the Hydronics Institute Division of AHRI and listed in the AHRI Directory of Certified Product Performance. Trim shall include, but not be limited to, the following factory-installed components that shall be factory tested on the boilers:
 - a. ASME approved relief valves of size and capacity to meet ASME Code.
 - b. Manual air vent valve.
 - c. Low water cutoff with manual reset, McDonnell & Miller 150-M.
 - d. Combination pressure and temperature gauge.
 - e. 5" dial stack thermometer.

3. The combustion chamber shall be designed to drain condensation to the bottom of the combustion chamber and heat exchanger assembly to the acid dilution box and integral drain trap. The complete combustion chamber and heat exchanger assembly shall carry a 10 year warranty. The boiler shall be capable of full modulation with a turndown ratio of 5:1.
4. A burner/flame observation port shall be provided. Burner shall be a premix design and constructed of high temperature stainless steel with a woven metal fiber outer covering. Boilers shall be supplied with a gas valve designed with negative pressure regulation and be equipped with a variable speed blower system to control the fuel/air mixture and to provide modulating boiler firing rates for maximum efficiency throughout the burner capacity range. Boilers shall operate in a safe condition with gas supply pressure as low as 4" of water column. The firing control system shall be direct spark ignition with electronic supervision.
5. Boilers shall have an independent laboratory rating for emissions of oxides of nitrogen (NOx) of 20 ppm or less corrected to 3% O2. The manufacturer shall verify proper operation of the burner, all controls and the heat exchanger by connection to water and venting for a factory fire test prior to shipping.
6. Boiler jacket assembly shall be constructed of heavy gauge metal, primed and painted on both sides. The combustion chamber shall be sealed and completely enclosed, independent of the outer jacket assembly. The boilers shall be equipped with leveling legs.
7. The integral control system shall, as a minimum, include the following:
 - a. Electronic 2-line, 16 character back-lit LCD display for boiler set-up, status, and diagnostics. Access to the set-up and diagnostic controls shall be restricted by password.
 - b. Control boiler sequences for outdoor air reset, pump delay with freeze protection, pump exercise, interface with up to 8 other boilers to rotate activation and control, including burner modulation, without requiring an external boiler sequence controller.
 - c. Terminal strips for electrical connections:
 - 1) A low voltage connection board for remote monitoring of safety and operating controls, including but not limited to, tank thermostat, supply sensor, outdoor sensor, and cascade control circuit.
 - d. A high voltage terminal strip for 120 V/60 hertz/single phase supply voltage. The high voltage terminal strip and integral relays shall provide independent control of the system and boiler pumps.
 - e. High and low gas pressure switches.
 - f. Manual low water cutoff reset.
 - g. Step down transformer to provide 24 VAC control circuit and components.
 - h. High limit temperature control with manual reset.
 - i. Outlet water temperature sensor.
 - j. Return water temperature sensor.
 - k. Outdoor air temperature sensor.
 - l. Flue gas temperature sensor.
 - m. Water flow switch.
8. All control components shall be easily accessed and serviceable from the front and top of the jacket.
9. Provide BACnet communication card for full integration with the building DDC system.
10. Direct vent sidewall system with a horizontal sidewall termination of both the vent outlet and combustion air inlet. Pipes shall be PVC, CPVC, or stainless steel sealed vent material terminating at the sidewall with the manufacturer's specified vent termination.
11. Manufacturer: Aerco, A.O. Smith, Cleaver-Brooks, Laars, or Lochinvar.

2.14 HORIZONTAL UNIT HEATERS

- A. Fans: propeller type with aluminum blades, factory dynamically balanced. Fan shall have a single-speed permanent split capacitor motor and an inlet guard.
- B. Coils: hot water type, as specified in Paragraph 2.01, Coils.
- C. Enclosures: steel with a baked enamel finish, and horizontal and vertical deflector vanes.
- D. Manufacturer: Airtherm, Dunham Bush, McQuay, Mestek, Modine, Reznor, Trane, or Vulcan.

2.15 CABINET UNIT HEATERS

- A. Cabinet type, complete with 1" thick throw away filters, forward-curved direct-driven fan, motor, and nonferrous heating coil. Unit shall be enclosed in steel cabinet with access panel, designed for ceiling mounting as indicated on the Drawings.
- B. Coils: hot water type, as specified in Paragraph 2.01, Coils.
- C. Units for above ceiling installation shall be provided with a duct collars at the outlet connections.
- D. Manufacturer: Airtherm, Dunham-Bush, Mestek, Modine, Reznor, Trane, or Vulcan.

2.16 ELECTRIC HEATING COILS

- A. UL listed, complete with terminal box with removable cover on the end of the coil, intermediate coil supports, automatically reset thermal cutouts for primary over-temperature protection, heat limiters or manually reset thermal cutouts for secondary over-temperature protection, and pressure differential airflow switch. Arrange circuiting to prevent stratification of hot and cold air.
- B. Heating elements: either sheathed or exposed element type.
 - 1. Sheathed Element Type:
 - a. Nickel chrome (80% nickel, 20% chrome) coiled wire imbedded in magnesium-oxide refractory material and enclosed in sheath. Spirally wound steel fins furnace brazed to steel sheath, or aluminum fins mechanically bonded to aluminum or steel sheath.
 - b. Heat-resistant nonoxidizing finish on sheath and fins. Copper-plated, high temperature aluminum finish, or ceramic coating.
 - c. Maximum 6 fins per in.
 - 2. Exposed Element Type:
 - a. Nickel chrome (80% nickel, 20% chrome) coiled wire, with minimum one wire diameter open space between adjacent coils.
 - b. Maximum wire density: 37 W/in².
 - c. Maximum wire surface temperature: 1400°F.
- C. Coil dimensions shall be the same as the duct in which installed or opening to which attached.
- D. Coils rated more than 48 A shall have heating elements subdivided. Each subdivided load shall not exceed 48 A and each nongrounded conductor shall be fuse protected.
- E. Integral control boxes shall contain a terminal block and terminals sized for single incoming power feeder; control circuit transformer with fused primary and fused 120 V secondary; 100000 cycle service, 3-pole line break contactor for each circuit and fuses, housed in a NEMA 1 enclosure.
- F. Remote control cabinets shall contain a control circuit transformer with fused primary and 120 V secondary; 100000 cycle service, 3-pole line break contactor for each circuit; fuses for each circuit and separate terminal blocks and terminals for a single incoming power feeder and control circuits, housed in a NEMA 1 cabinet. Main busses and main lugs shall be sized for main feeder.
- G. Energize contactors through pilot duty devices, PE switches and multistep thermostats up to 3 steps, step controllers for more than 3 steps. Step controllers shall recycle on power interruption.
- H. Provide a wiring diagram showing terminal designations of power and control circuits, mounted inside the control box or cabinet.
- I. Manufacturer: Brasch, INDEECO, Markel HF, or Nailor.

2.17 PRECISION AIR CONDITIONING UNITS

- A. Ceiling-Mounted Type Units:
 - 1. Air-cooled type, factory-assembled, UL listed, ceiling-mounted or ducted horizontal type.
 - 2. Cabinets: cabinets and chassis shall be constructed of heavy gauge galvanized steel and designed for installation and service access from the room side only. Ceiling-mounted units shall be designed for installation in a 24" x 48" ceiling grid and shall have integral supply and return grilles. Ducted horizontal units shall have duct flanges, gasketed access doors, and cabinet construction designed for installation outside of the conditioned space.

3. Fans: direct-drive fan assembly equipped with double-inlet blower, self-aligning sleeve bearings, and lifetime lubrication. Fan motor shall be permanent-split capacitor, 2-speed type.
4. Filters: pleated prefilter type, as specified in Section 23 70 00, Air Distribution. Filters shall be removable without shutting down the system.
5. Humidifier: steam generator type, factory-piped, mounted and wired to the integral control system. Steam generator shall provide dry steam to the bypass air around the evaporator coil. Controls for the humidification system shall include humidity setpoint, automatic water feed, and drain valves.
6. Reheat: low watt density, finned-tubular electric type, with UL classified safety switches, capable of maintaining room dry bulb conditions when the system is calling for dehumidification.
7. Controls: microprocessor-based, in a wall-mounted control enclosure containing an LCD custom display providing a continuous display of operating status and alarm conditions. An 8 key membrane keypad for setpoint/program control, unit on-off switch, and fan speed control shall be located below the display.
 - a. Controls shall have 2 temperature control setpoints for cooling and heating functions with a minimum 2°F differential between them. Controls shall automatically switch from cooling to heating modes based on return air conditions. The temperature control setpoint range shall be 40°F to 85°F.
 - b. Controls shall have 2 humidity control setpoints for humidification and dehumidification functions with a minimum 4% RH differential between them. Controls shall automatically switch from humidifying to dehumidifying based on return air conditions. The humidity control setpoint range shall be 20% RH to 80% RH. Dehumidification shall utilize the low fan speed.
 - c. Controls shall be programmable on a daily basis or on a 5 day/2 day program schedule, and shall be capable of accepting 2 programs per day.
 - d. Controls shall include the capabilities to calibrate the temperature and humidity sensors and adjust the sensor response delay time from 10 s to 90 s.
 - e. Controls shall be capable of displaying temperature values in Fahrenheit or Centigrade.
 - f. The LCD display shall provide indication of on-off, fan speed, operating mode (cooling, heating, humidifying, dehumidifying), and current day, time, temperature and humidity.
 - g. Controls shall monitor unit operation and activate an audible and visual alarm for the following field adjustable conditions:
 - 1) High temperature: maximum 90°F.
 - 2) Low temperature: minimum 35°F.
 - 3) High humidity: maximum 85% RH.
 - 4) Low humidity: minimum 15% RH.
 - h. Controls shall be capable of disabling any alarm if required.
8. Cooling coils: copper tubes and aluminum fins, as specified in Paragraph 2.01, Coils. Drain pan shall be stainless steel.
9. Refrigeration system: hermetic compressor, pressure safety switches, externally equalized expansion valve, and a refrigerant sight glass and moisture indicator.
10. Condensers: split system, air-cooled type, with a direct-drive propeller type fan. Components shall be factory-assembled, charged with refrigerant, sealed and be capable of being connected to the evaporator section using precharged refrigerant line sets. Condenser shall be designed for 105°F ambient and be capable of operation to -30°F.
11. Condensate pumps: complete with pump, motor, integral float switch, reservoir, and secondary float switch to shutdown the unit upon a high water level condition.
12. Manufacturer: APC/Network Air/Airflow, Data Aire, Liebert, or Stulz-ATS.

PART 3 EXECUTION

3.01 ELECTRONIC STEAM HUMIDIFIERS

- A. Provide a spare steam generator for each humidifier and turn over to the Owner. Obtain signed receipt.
- B. Water tempering devices external to the humidifier, if required, shall be located as close as possible to the humidifier.

3.02 TERMINAL UNITS

- A. Install terminal units with manufacturer's recommended upstream duct conditions for operation of velocity sensors and volume controls, and required clearances for control panels, coils, and other components.

3.03 AIR HANDLING UNITS

- A. For air handling units with coil sections that are near the floor, coordinate the unit mounting height with the condensate drain trap detail. If the bottom of the insulated drain trap conflicts with the floor slab, provide height adjustment supports between the air handling unit and housekeeping pad. Locate supports at manufacturer recommended load points.

3.04 PUMPS

- A. Furnish an extra set of mechanical seals for each pump and submit receipt acknowledging same.
- B. Provide base elbow supports for horizontal connections to base-mounted pumps.
- C. Install back pull-out type pumps with space and accommodations for back pull-out per the manufacturer's recommendations.
- D. Pump and motor alignment for each flexible-coupled pump shall be verified to be $\pm 0.002"$ by the manufacturer after pump and piping have been installed and base has been grouted. Submit a written statement verifying completion and tolerance of alignment.

3.05 BOILERS

- A. Provide the services of factory-trained technicians for 2 days to place the boiler plant, including boilers and boiler sequence programmer in service, and to assist in flushing, treatment, and testing, adjusting and balancing. An operational performance test shall be made at the time the system is placed in operation, including operation of controls, safeties, alarms, and indicators. The operational performance test may be witnessed by the Owner.
- B. Test relief valves and record cracking and reseating pressures.
- C. Submit signed statement by boiler manufacturer certifying results of tests and that boiler performance and operation is in accordance with manufacturer's recommendations and specifications.

END OF SECTION

PERTAINING TO THE DRAWINGS

DELETE:	A-101	Plan keynote number 20 "Not Used"
ADD:	A-101	Electrical Security Gate - see TLC Drawing. Plan keynote number 20
DELETE:	A-101-D	Demolition note DM-8 - Contractor shall remove slab-on-grade (approx 3'-0"x3'-0: ") columns covering, repair as required after strengthening of columns D-2, D-3, F-3, H-3, K-3, K-4, K-1-5.1 and k-2-5.1.
ADD:	A-101-D	Demolition note DM-8. Contractor shall remove slab-on grade (approx 3'-0" x 3'-0") column covering, repair as required after strengthening of column H.1-4.
DELETE:	A-102-D	Same as A101-D Demolition Note DM-8
ADD:	A-102-D	Same as A101-D Demolition Note DM-8
DELETE:	A-103-D	Demo Note DM-6 column covering shall be removed for the strengthening of columns D2, D3, E4,F3, F4, G.1.5.1, H3, H4, K3, K4, K-5.1, K2.5.1
ADD:	A-103-D	Demo note DM-6 – Column covering shall be removed for the strengthening of column H.1-4.
ADD:	A-121	Corridor C101 Ceiling was changed to a rated gypsum wallboard ceiling.
DELETE:	A-121-D	Sheet A-121-D dated May 15, 2014 in its entirety
ADD:	A-121-D	A-121-D dated June 19, 2014
DETELE:	A-124	Key note 3. No sprinkler curtain is required with the fire shutters
DELETE:	A-711	Sheet A-711 dated May 15, 2014 in its entirety
ADD:	A-711	Sheet A-711 dated June 24, 2014
DELETE:	M201	Sheet M201 without Engineer's Stamp dated May 2014
ADD:	M201	This sheet with Engineer's stamp date May 15, 2014
DELETE:	M703	Sheet M703 with text outside of sheet Boarder lines
ADD:	M703	Sheet M703 with text inside of sheet border lines
DELETE:	P201D	Plumbing pressure existing first floor plan dated May 15, 2014
ADD:	P201D	Plumbing pressure existing first floor plan dated June 25, 2014.
DELETE:	P202D	Plumbing existing second floor plan dated May 15, 2014
ADD:	P202D	Plumbing pressure existing second floor plan dated June 24, 2014
DELETE:	P203D	Plumbing pressure existing third floor plan dated May 15, 2014
ADD:	P203D	Plumbing pressure existing third floor plan dated June 24, 2014
DELETE:	P204D	Plumbing pressure existing fourth floor plan dated May 15, 2014

ADD:	P204D	Plumbing pressure existing fourth floor plan dated June 24, 2014
ADD:	SG.1.20	Sign type 13.2 ceiling mounted in this Addendum.
DELETE:	SLP.2	Interior sign location plan Level 2
ADD:	SLP.2	Interior sign location plan Level 2 this Addendum.
DELETE:	SLP.3	Interior sign location plan Level 3
ADD:	SLP.3	Interior Sign location plan Level 3 this Addendum.
DELETE:	-	AARL Signage and Graphics – Budget Pricing dated December 17, 2013
ADD:	-	AARL Signage and Graphics – Budget Pricing dated June 24, 2014
DELETE:	F-1.1	GC provided furniture plan dated 5-13-14
ADD:	F-1.1	GC provided furniture plan dated 6-24-14
DELETE:	F-1.2	GC provided furniture plan dated 5-13-14
ADD:	F-1.2	GC provided furniture plan dated 6-24-14
DELETE:	F-1.3	GC provided furniture plan dated 5-13-14
ADD:	F-1.3	GC provided furniture plan dated 6-24-14
DELETE:	F-1.4	GC provided furniture plan dated 5-13-14
ADD:	F-1.4	GC provided furniture plan dated 6-24-14
DELETE:	S-001	Structural General Notes dated 5-15-14
ADD:	S-001	Structural General Notes dated 6-24-14
DELETE:	S-002	Structural General Notes dated 5-15-14
ADD:	S-002	Structural General Notes dated 6-24-14
DELETE:	S-101	1 st floor plan dated 5-15-14
ADD:	S-101	1 st floor plan dated 6-24-14
DELETE:	S-101D	1 st floor plan demo dated 5-14-14
ADD:	S-101D	1 st floor plan demo dated 6-24-14
DELETE:	S-102	2 nd floor plan dated 5-15-14
ADD:	S-102	2 nd floor plan dated 6-24-14
DELETE:	S-102D	2 nd floor plan - demo dated 5-15-14
ADD:	S-102D	2 nd floor plan - demo dated 6-24-14
DELETE:	S-103	3 rd floor plan dated 5-15-14
ADD:	S-103	3 rd floor plan dated 6-24-14
DELETE:	S-103D	3 rd floor plan - demo dated 5-15-14
ADD:	S-103D	3 rd floor plan - demo dated 6-24-14
DELETE:	S-104D	4 th floor plan - demo dated 5-15-14
ADD:	S-104D	4 th floor plan - demo dated 6-24-14

DELETE:	S-302	Typical foundation details dated 5-15-14
ADD:	S-302	Typical foundation details dated 6-24-14
DELETE:	S-303	Typical foundation details dated 5-15-14
ADD:	S-303	Typical foundation details dated 6-24-14
DELETE:	S-304	Foundation details dated 5-15-14
ADD:	S-304	Foundation details dated 6-24-14
DELETE:	S-305	Foundation details dated 5-15-14
ADD:	S-305	Foundation details dated 6-24-14
DELETE:	S-402	Masonry detail dated 5-15-14
ADD:	S-402	Masonry detail dated 6-24-14
DELETE:	S-506	Steel framing details dated 5-15-14
ADD:	S-506	Steel framing details dated 6-24-14
DELETE:	S-507	Steel framing details dated 5-15-14
ADD:	S-507	Steel framing details dated 6-24-14

SUPPLEMENTARY DRAWINGS

ADD:	SD-101	Sheet SD-101- Supplementary Drawing for 2/A-125 and 12/A-125
ADD:	SD-102	Sheet SD-102 - Supplementary Drawing for 18/A-125
ADD:	SD-103	Sheet SD-103 - Supplementary Drawing for 3/A521 and 6/A-521
ADD:	SD-104	Sheet SD-104 - Supplementary Drawing for 5/I-521 and 4/A-521
ADD:	SD-105	Sheet SD-105 - Supplementary Drawing for 6/A-551
ADD:	SD-106	Sheet SD-106 - Supplementary Drawing for 7/A-321 and 8/A-321
ADD:	SD-107	Sheet SD-107 - Supplementary Drawing for 10/A-901 and 2/A-903
ADD:	SD-108	Sheet SD-108 - Supplementary Drawing for 10/A-903 and 13/A- 903
ADD:	SD-109	Sheet SD-109 - Supplementary Drawing for A-106
ADD:	SDL-1	SDL-1 Concrete steps and railing dated 6-24-14
ADD:	SDL-2	SDL – 2 Accessible ramp and railing dated 6-24-14
ADD:	-	Parking low ramp enlargement dated 6-14-14
ADD:	-	Auditorium exit ramp enlargement dated 6-24-14.
