



**CLEMONS,
RUTHERFORD
& ASSOCIATES, INC.**

ARCHITECTS

▪

PLANNERS

▪

INTERIOR DESIGNERS

▪

CONSTRUCTION MANAGERS

2027 Thomasville Road
Tallahassee, FL 32308
p: 850-385-6153
f: 850-386-8420
www.craarchitects.com

PROJECT MANUAL

BOARD OF COUNTY COMMISSIONERS
LEON COUNTY

DISTRICT TWO MEDICAL EXAMINER'S OFFICE

525 APPELYARD DRIVE
TALLAHASSEE, FLORIDA

CRA PROJECT NUMBER: 15103

August 18, 2017

(V.E. BID DOCUMENTS)

VOLUME I
1 OF 2 VOLUMES

SET NUMBER:

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LEON COUNTY
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The "General Conditions of the Contract for Construction", The American Institute of Architects' (AIA) Document A201-2007, thirty-nine (39) pages, along with "Additions and Deletions Report", one (1) page, and "Certification of Document's Authenticity" Document D401, one (1) page, is included herein.

END OF SECTION 000700



AIA[®] Document A201[™] – 2007

General Conditions of the Contract for Construction

for the following PROJECT:
(Name and location or address)

THE OWNER:
(Name, legal status and address)

THE ARCHITECT:
(Name, legal status and address)

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ADDITIONS AND DELETIONS:
The author of this document has added information needed for its completion. The author may also have revised the text of the original AIA standard form. An *Additions and Deletions Report* that notes added information as well as revisions to the standard form text is available from the author and should be reviewed. A vertical line in the left margin of this document indicates where the author has added necessary information and where the author has added to or deleted from the original AIA text.

This document has important legal consequences. Consultation with an attorney is encouraged with respect to its completion or modification.

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ARTICLE 1 GENERAL PROVISIONS

§ 1.1 BASIC DEFINITIONS

§ 1.1.1 THE CONTRACT DOCUMENTS

The Contract Documents are enumerated in the Agreement between the Owner and Contractor (hereinafter the Agreement) and consist of the Agreement, Conditions of the Contract (General, Supplementary and other Conditions), Drawings, Specifications, Addenda issued prior to execution of the Contract, other documents listed in the Agreement and Modifications issued after execution of the Contract. A Modification is (1) a written amendment to the Contract signed by both parties, (2) a Change Order, (3) a Construction Change Directive or (4) a written order for a minor change in the Work issued by the Architect. Unless specifically enumerated in the Agreement, the Contract Documents do not include the advertisement or invitation to bid, Instructions to Bidders, sample forms, other information furnished by the Owner in anticipation of receiving bids or proposals, the Contractor's bid or proposal, or portions of Addenda relating to bidding requirements.

§ 1.1.2 THE CONTRACT

The Contract Documents form the Contract for Construction. The Contract represents the entire and integrated agreement between the parties hereto and supersedes prior negotiations, representations or agreements, either written or oral. The Contract may be amended or modified only by a Modification. The Contract Documents shall not be construed to create a contractual relationship of any kind (1) between the Contractor and the Architect or the Architect's consultants, (2) between the Owner and a Subcontractor or a Sub-subcontractor, (3) between the Owner and the Architect or the Architect's consultants or (4) between any persons or entities other than the Owner and the Contractor. The Architect shall, however, be entitled to performance and enforcement of obligations under the Contract intended to facilitate performance of the Architect's duties.

§ 1.1.3 THE WORK

The term "Work" means the construction and services required by the Contract Documents, whether completed or partially completed, and includes all other labor, materials, equipment and services provided or to be provided by the Contractor to fulfill the Contractor's obligations. The Work may constitute the whole or a part of the Project.

§ 1.1.4 THE PROJECT

The Project is the total construction of which the Work performed under the Contract Documents may be the whole or a part and which may include construction by the Owner and by separate contractors.

§ 1.1.5 THE DRAWINGS

The Drawings are the graphic and pictorial portions of the Contract Documents showing the design, location and dimensions of the Work, generally including plans, elevations, sections, details, schedules and diagrams.

§ 1.1.6 THE SPECIFICATIONS

The Specifications are that portion of the Contract Documents consisting of the written requirements for materials, equipment, systems, standards and workmanship for the Work, and performance of related services.

§ 1.1.7 INSTRUMENTS OF SERVICE

Instruments of Service are representations, in any medium of expression now known or later developed, of the tangible and intangible creative work performed by the Architect and the Architect's consultants under their respective professional services agreements. Instruments of Service may include, without limitation, studies, surveys, models, sketches, drawings, specifications, and other similar materials.

§ 1.1.8 INITIAL DECISION MAKER

The Initial Decision Maker is the person identified in the Agreement to render initial decisions on Claims in accordance with Section 15.2 and certify termination of the Agreement under Section 14.2.2.

§ 1.2 CORRELATION AND INTENT OF THE CONTRACT DOCUMENTS

§ 1.2.1 The intent of the Contract Documents is to include all items necessary for the proper execution and completion of the Work by the Contractor. The Contract Documents are complementary, and what is required by one shall be as binding as if required by all; performance by the Contractor shall be required only to the extent consistent with the Contract Documents and reasonably inferable from them as being necessary to produce the indicated results.

§ 1.2.2 Organization of the Specifications into divisions, sections and articles, and arrangement of Drawings shall not control the Contractor in dividing the Work among Subcontractors or in establishing the extent of Work to be performed by any trade.

§ 1.2.3 Unless otherwise stated in the Contract Documents, words that have well-known technical or construction industry meanings are used in the Contract Documents in accordance with such recognized meanings.

§ 1.3 CAPITALIZATION

Terms capitalized in these General Conditions include those that are (1) specifically defined, (2) the titles of numbered articles or (3) the titles of other documents published by the American Institute of Architects.

§ 1.4 INTERPRETATION

In the interest of brevity the Contract Documents frequently omit modifying words such as "all" and "any" and articles such as "the" and "an," but the fact that a modifier or an article is absent from one statement and appears in another is not intended to affect the interpretation of either statement.

§ 1.5 OWNERSHIP AND USE OF DRAWINGS, SPECIFICATIONS AND OTHER INSTRUMENTS OF SERVICE

§ 1.5.1 The Architect and the Architect's consultants shall be deemed the authors and owners of their respective Instruments of Service, including the Drawings and Specifications, and will retain all common law, statutory and other reserved rights, including copyrights. The Contractor, Subcontractors, Sub-subcontractors, and material or equipment suppliers shall not own or claim a copyright in the Instruments of Service. Submittal or distribution to meet official regulatory requirements or for other purposes in connection with this Project is not to be construed as publication in derogation of the Architect's or Architect's consultants' reserved rights.

§ 1.5.2 The Contractor, Subcontractors, Sub-subcontractors and material or equipment suppliers are authorized to use and reproduce the Instruments of Service provided to them solely and exclusively for execution of the Work. All copies made under this authorization shall bear the copyright notice, if any, shown on the Instruments of Service. The Contractor, Subcontractors, Sub-subcontractors, and material or equipment suppliers may not use the Instruments of Service on other projects or for additions to this Project outside the scope of the Work without the specific written consent of the Owner, Architect and the Architect's consultants.

§ 1.6 TRANSMISSION OF DATA IN DIGITAL FORM

If the parties intend to transmit Instruments of Service or any other information or documentation in digital form, they shall endeavor to establish necessary protocols governing such transmissions, unless otherwise already provided in the Agreement or the Contract Documents.

ARTICLE 2 OWNER

§ 2.1 GENERAL

§ 2.1.1 The Owner is the person or entity identified as such in the Agreement and is referred to throughout the Contract Documents as if singular in number. The Owner shall designate in writing a representative who shall have express authority to bind the Owner with respect to all matters requiring the Owner's approval or authorization. Except as otherwise provided in Section 4.2.1, the Architect does not have such authority. The term "Owner" means the Owner or the Owner's authorized representative.

§ 2.1.2 The Owner shall furnish to the Contractor within fifteen days after receipt of a written request, information necessary and relevant for the Contractor to evaluate, give notice of or enforce mechanic's lien rights. Such information shall include a correct statement of the record legal title to the property on which the Project is located, usually referred to as the site, and the Owner's interest therein.

§ 2.2 INFORMATION AND SERVICES REQUIRED OF THE OWNER

§ 2.2.1 Prior to commencement of the Work, the Contractor may request in writing that the Owner provide reasonable evidence that the Owner has made financial arrangements to fulfill the Owner's obligations under the Contract. Thereafter, the Contractor may only request such evidence if (1) the Owner fails to make payments to the Contractor as the Contract Documents require; (2) a change in the Work materially changes the Contract Sum; or (3) the Contractor identifies in writing a reasonable concern regarding the Owner's ability to make payment when due. The Owner shall furnish such evidence as a condition precedent to commencement or continuation of the Work or the

portion of the Work affected by a material change. After the Owner furnishes the evidence, the Owner shall not materially vary such financial arrangements without prior notice to the Contractor.

§ 2.2.2 Except for permits and fees that are the responsibility of the Contractor under the Contract Documents, including those required under Section 3.7.1, the Owner shall secure and pay for necessary approvals, easements, assessments and charges required for construction, use or occupancy of permanent structures or for permanent changes in existing facilities.

§ 2.2.3 The Owner shall furnish surveys describing physical characteristics, legal limitations and utility locations for the site of the Project, and a legal description of the site. The Contractor shall be entitled to rely on the accuracy of information furnished by the Owner but shall exercise proper precautions relating to the safe performance of the Work.

§ 2.2.4 The Owner shall furnish information or services required of the Owner by the Contract Documents with reasonable promptness. The Owner shall also furnish any other information or services under the Owner's control and relevant to the Contractor's performance of the Work with reasonable promptness after receiving the Contractor's written request for such information or services.

§ 2.2.5 Unless otherwise provided in the Contract Documents, the Owner shall furnish to the Contractor one copy of the Contract Documents for purposes of making reproductions pursuant to Section 1.5.2.

§ 2.3 OWNER'S RIGHT TO STOP THE WORK

If the Contractor fails to correct Work that is not in accordance with the requirements of the Contract Documents as required by Section 12.2 or repeatedly fails to carry out Work in accordance with the Contract Documents, the Owner may issue a written order to the Contractor to stop the Work, or any portion thereof, until the cause for such order has been eliminated; however, the right of the Owner to stop the Work shall not give rise to a duty on the part of the Owner to exercise this right for the benefit of the Contractor or any other person or entity, except to the extent required by Section 6.1.3.

§ 2.4 OWNER'S RIGHT TO CARRY OUT THE WORK

If the Contractor defaults or neglects to carry out the Work in accordance with the Contract Documents and fails within a ten-day period after receipt of written notice from the Owner to commence and continue correction of such default or neglect with diligence and promptness, the Owner may, without prejudice to other remedies the Owner may have, correct such deficiencies. In such case an appropriate Change Order shall be issued deducting from payments then or thereafter due the Contractor the reasonable cost of correcting such deficiencies, including Owner's expenses and compensation for the Architect's additional services made necessary by such default, neglect or failure. Such action by the Owner and amounts charged to the Contractor are both subject to prior approval of the Architect. If payments then or thereafter due the Contractor are not sufficient to cover such amounts, the Contractor shall pay the difference to the Owner.

ARTICLE 3 CONTRACTOR

§ 3.1 GENERAL

§ 3.1.1 The Contractor is the person or entity identified as such in the Agreement and is referred to throughout the Contract Documents as if singular in number. The Contractor shall be lawfully licensed, if required in the jurisdiction where the Project is located. The Contractor shall designate in writing a representative who shall have express authority to bind the Contractor with respect to all matters under this Contract. The term "Contractor" means the Contractor or the Contractor's authorized representative.

§ 3.1.2 The Contractor shall perform the Work in accordance with the Contract Documents.

§ 3.1.3 The Contractor shall not be relieved of obligations to perform the Work in accordance with the Contract Documents either by activities or duties of the Architect in the Architect's administration of the Contract, or by tests, inspections or approvals required or performed by persons or entities other than the Contractor.

§ 3.2 REVIEW OF CONTRACT DOCUMENTS AND FIELD CONDITIONS BY CONTRACTOR

§ 3.2.1 Execution of the Contract by the Contractor is a representation that the Contractor has visited the site, become generally familiar with local conditions under which the Work is to be performed and correlated personal observations with requirements of the Contract Documents.

§ 3.2.2 Because the Contract Documents are complementary, the Contractor shall, before starting each portion of the Work, carefully study and compare the various Contract Documents relative to that portion of the Work, as well as the information furnished by the Owner pursuant to Section 2.2.3, shall take field measurements of any existing conditions related to that portion of the Work, and shall observe any conditions at the site affecting it. These obligations are for the purpose of facilitating coordination and construction by the Contractor and are not for the purpose of discovering errors, omissions, or inconsistencies in the Contract Documents; however, the Contractor shall promptly report to the Architect any errors, inconsistencies or omissions discovered by or made known to the Contractor as a request for information in such form as the Architect may require. It is recognized that the Contractor's review is made in the Contractor's capacity as a contractor and not as a licensed design professional, unless otherwise specifically provided in the Contract Documents.

§ 3.2.3 The Contractor is not required to ascertain that the Contract Documents are in accordance with applicable laws, statutes, ordinances, codes, rules and regulations, or lawful orders of public authorities, but the Contractor shall promptly report to the Architect any nonconformity discovered by or made known to the Contractor as a request for information in such form as the Architect may require.

§ 3.2.4 If the Contractor believes that additional cost or time is involved because of clarifications or instructions the Architect issues in response to the Contractor's notices or requests for information pursuant to Sections 3.2.2 or 3.2.3, the Contractor shall make Claims as provided in Article 15. If the Contractor fails to perform the obligations of Sections 3.2.2 or 3.2.3, the Contractor shall pay such costs and damages to the Owner as would have been avoided if the Contractor had performed such obligations. If the Contractor performs those obligations, the Contractor shall not be liable to the Owner or Architect for damages resulting from errors, inconsistencies or omissions in the Contract Documents, for differences between field measurements or conditions and the Contract Documents, or for nonconformities of the Contract Documents to applicable laws, statutes, ordinances, codes, rules and regulations, and lawful orders of public authorities.

§ 3.3 SUPERVISION AND CONSTRUCTION PROCEDURES

§ 3.3.1 The Contractor shall supervise and direct the Work, using the Contractor's best skill and attention. The Contractor shall be solely responsible for, and have control over, construction means, methods, techniques, sequences and procedures and for coordinating all portions of the Work under the Contract, unless the Contract Documents give other specific instructions concerning these matters. If the Contract Documents give specific instructions concerning construction means, methods, techniques, sequences or procedures, the Contractor shall evaluate the jobsite safety thereof and, except as stated below, shall be fully and solely responsible for the jobsite safety of such means, methods, techniques, sequences or procedures. If the Contractor determines that such means, methods, techniques, sequences or procedures may not be safe, the Contractor shall give timely written notice to the Owner and Architect and shall not proceed with that portion of the Work without further written instructions from the Architect. If the Contractor is then instructed to proceed with the required means, methods, techniques, sequences or procedures without acceptance of changes proposed by the Contractor, the Owner shall be solely responsible for any loss or damage arising solely from those Owner-required means, methods, techniques, sequences or procedures.

§ 3.3.2 The Contractor shall be responsible to the Owner for acts and omissions of the Contractor's employees, Subcontractors and their agents and employees, and other persons or entities performing portions of the Work for, or on behalf of, the Contractor or any of its Subcontractors.

§ 3.3.3 The Contractor shall be responsible for inspection of portions of Work already performed to determine that such portions are in proper condition to receive subsequent Work.

§ 3.4 LABOR AND MATERIALS

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

§ 3.4.2 Except in the case of minor changes in the Work authorized by the Architect in accordance with Sections 3.12.8 or 7.4, the Contractor may make substitutions only with the consent of the Owner, after evaluation by the Architect and in accordance with a Change Order or Construction Change Directive.

§ 3.4.3 The Contractor shall enforce strict discipline and good order among the Contractor's employees and other persons carrying out the Work. The Contractor shall not permit employment of unfit persons or persons not properly skilled in tasks assigned to them.

§ 3.5 WARRANTY

The Contractor warrants to the Owner and Architect that materials and equipment furnished under the Contract will be of good quality and new unless the Contract Documents require or permit otherwise. The Contractor further warrants that the Work will conform to the requirements of the Contract Documents and will be free from defects, except for those inherent in the quality of the Work the Contract Documents require or permit. Work, materials, or equipment not conforming to these requirements may be considered defective. The Contractor's warranty excludes remedy for damage or defect caused by abuse, alterations to the Work not executed by the Contractor, improper or insufficient maintenance, improper operation, or normal wear and tear and normal usage. If required by the Architect, the Contractor shall furnish satisfactory evidence as to the kind and quality of materials and equipment.

§ 3.6 TAXES

The Contractor shall pay sales, consumer, use and similar taxes for the Work provided by the Contractor that are legally enacted when bids are received or negotiations concluded, whether or not yet effective or merely scheduled to go into effect.

§ 3.7 PERMITS, FEES, NOTICES, AND COMPLIANCE WITH LAWS

§ 3.7.1 Unless otherwise provided in the Contract Documents, the Contractor shall secure and pay for the building permit as well as for other permits, fees, licenses, and inspections by government agencies necessary for proper execution and completion of the Work that are customarily secured after execution of the Contract and legally required at the time bids are received or negotiations concluded.

§ 3.7.2 The Contractor shall comply with and give notices required by applicable laws, statutes, ordinances, codes, rules and regulations, and lawful orders of public authorities applicable to performance of the Work.

§ 3.7.3 If the Contractor performs Work knowing it to be contrary to applicable laws, statutes, ordinances, codes, rules and regulations, or lawful orders of public authorities, the Contractor shall assume appropriate responsibility for such Work and shall bear the costs attributable to correction.

§ 3.7.4 **Concealed or Unknown Conditions.** If the Contractor encounters conditions at the site that are (1) subsurface or otherwise concealed physical conditions that differ materially from those indicated in the Contract Documents or (2) unknown physical conditions of an unusual nature, that differ materially from those ordinarily found to exist and generally recognized as inherent in construction activities of the character provided for in the Contract Documents, the Contractor shall promptly provide notice to the Owner and the Architect before conditions are disturbed and in no event later than 21 days after first observance of the conditions. The Architect will promptly investigate such conditions and, if the Architect determines that they differ materially and cause an increase or decrease in the Contractor's cost of, or time required for, performance of any part of the Work, will recommend an equitable adjustment in the Contract Sum or Contract Time, or both. If the Architect determines that the conditions at the site are not materially different from those indicated in the Contract Documents and that no change in the terms of the Contract is justified, the Architect shall promptly notify the Owner and Contractor in writing, stating the reasons. If either party disputes the Architect's determination or recommendation, that party may proceed as provided in Article 15.

§ 3.7.5 If, in the course of the Work, the Contractor encounters human remains or recognizes the existence of burial markers, archaeological sites or wetlands not indicated in the Contract Documents, the Contractor shall immediately suspend any operations that would affect them and shall notify the Owner and Architect. Upon receipt of such notice, the Owner shall promptly take any action necessary to obtain governmental authorization required to resume the operations. The Contractor shall continue to suspend such operations until otherwise instructed by the Owner but shall continue with all other operations that do not affect those remains or features. Requests for adjustments in the Contract Sum and Contract Time arising from the existence of such remains or features may be made as provided in Article 15.

§ 3.8 ALLOWANCES

§ 3.8.1 The Contractor shall include in the Contract Sum all allowances stated in the Contract Documents. Items covered by allowances shall be supplied for such amounts and by such persons or entities as the Owner may direct, but the Contractor shall not be required to employ persons or entities to whom the Contractor has reasonable objection.

§ 3.8.2 Unless otherwise provided in the Contract Documents,

- .1 allowances shall cover the cost to the Contractor of materials and equipment delivered at the site and all required taxes, less applicable trade discounts;
- .2 Contractor's costs for unloading and handling at the site, labor, installation costs, overhead, profit and other expenses contemplated for stated allowance amounts shall be included in the Contract Sum but not in the allowances; and
- .3 whenever costs are more than or less than allowances, the Contract Sum shall be adjusted accordingly by Change Order. The amount of the Change Order shall reflect (1) the difference between actual costs and the allowances under Section 3.8.2.1 and (2) changes in Contractor's costs under Section 3.8.2.2.

§ 3.8.3 Materials and equipment under an allowance shall be selected by the Owner with reasonable promptness.

§ 3.9 SUPERINTENDENT

§ 3.9.1 The Contractor shall employ a competent superintendent and necessary assistants who shall be in attendance at the Project site during performance of the Work. The superintendent shall represent the Contractor, and communications given to the superintendent shall be as binding as if given to the Contractor.

§ 3.9.2 The Contractor, as soon as practicable after award of the Contract, shall furnish in writing to the Owner through the Architect the name and qualifications of a proposed superintendent. The Architect may reply within 14 days to the Contractor in writing stating (1) whether the Owner or the Architect has reasonable objection to the proposed superintendent or (2) that the Architect requires additional time to review. Failure of the Architect to reply within the 14 day period shall constitute notice of no reasonable objection.

§ 3.9.3 The Contractor shall not employ a proposed superintendent to whom the Owner or Architect has made reasonable and timely objection. The Contractor shall not change the superintendent without the Owner's consent, which shall not unreasonably be withheld or delayed.

§ 3.10 CONTRACTOR'S CONSTRUCTION SCHEDULES

§ 3.10.1 The Contractor, promptly after being awarded the Contract, shall prepare and submit for the Owner's and Architect's information a Contractor's construction schedule for the Work. The schedule shall not exceed time limits current under the Contract Documents, shall be revised at appropriate intervals as required by the conditions of the Work and Project, shall be related to the entire Project to the extent required by the Contract Documents, and shall provide for expeditious and practicable execution of the Work.

§ 3.10.2 The Contractor shall prepare a submittal schedule, promptly after being awarded the Contract and thereafter as necessary to maintain a current submittal schedule, and shall submit the schedule(s) for the Architect's approval. The Architect's approval shall not unreasonably be delayed or withheld. The submittal schedule shall (1) be coordinated with the Contractor's construction schedule, and (2) allow the Architect reasonable time to review submittals. If the Contractor fails to submit a submittal schedule, the Contractor shall not be entitled to any increase in Contract Sum or extension of Contract Time based on the time required for review of submittals.

§ 3.10.3 The Contractor shall perform the Work in general accordance with the most recent schedules submitted to the Owner and Architect.

§ 3.11 DOCUMENTS AND SAMPLES AT THE SITE

The Contractor shall maintain at the site for the Owner one copy of the Drawings, Specifications, Addenda, Change Orders and other Modifications, in good order and marked currently to indicate field changes and selections made during construction, and one copy of approved Shop Drawings, Product Data, Samples and similar required submittals. These shall be available to the Architect and shall be delivered to the Architect for submittal to the Owner upon completion of the Work as a record of the Work as constructed.

§ 3.12 SHOP DRAWINGS, PRODUCT DATA AND SAMPLES

§ 3.12.1 Shop Drawings are drawings, diagrams, schedules and other data specially prepared for the Work by the Contractor or a Subcontractor, Sub-subcontractor, manufacturer, supplier or distributor to illustrate some portion of the Work.

§ 3.12.2 Product Data are illustrations, standard schedules, performance charts, instructions, brochures, diagrams and other information furnished by the Contractor to illustrate materials or equipment for some portion of the Work.

§ 3.12.3 Samples are physical examples that illustrate materials, equipment or workmanship and establish standards by which the Work will be judged.

§ 3.12.4 Shop Drawings, Product Data, Samples and similar submittals are not Contract Documents. Their purpose is to demonstrate the way by which the Contractor proposes to conform to the information given and the design concept expressed in the Contract Documents for those portions of the Work for which the Contract Documents require submittals. Review by the Architect is subject to the limitations of Section 4.2.7. Informational submittals upon which the Architect is not expected to take responsive action may be so identified in the Contract Documents. Submittals that are not required by the Contract Documents may be returned by the Architect without action.

§ 3.12.5 The Contractor shall review for compliance with the Contract Documents, approve and submit to the Architect Shop Drawings, Product Data, Samples and similar submittals required by the Contract Documents in accordance with the submittal schedule approved by the Architect or, in the absence of an approved submittal schedule, with reasonable promptness and in such sequence as to cause no delay in the Work or in the activities of the Owner or of separate contractors.

§ 3.12.6 By submitting Shop Drawings, Product Data, Samples and similar submittals, the Contractor represents to the Owner and Architect that the Contractor has (1) reviewed and approved them, (2) determined and verified materials, field measurements and field construction criteria related thereto, or will do so and (3) checked and coordinated the information contained within such submittals with the requirements of the Work and of the Contract Documents.

§ 3.12.7 The Contractor shall perform no portion of the Work for which the Contract Documents require submittal and review of Shop Drawings, Product Data, Samples or similar submittals until the respective submittal has been approved by the Architect.

§ 3.12.8 The Work shall be in accordance with approved submittals except that the Contractor shall not be relieved of responsibility for deviations from requirements of the Contract Documents by the Architect's approval of Shop Drawings, Product Data, Samples or similar submittals unless the Contractor has specifically informed the Architect in writing of such deviation at the time of submittal and (1) the Architect has given written approval to the specific deviation as a minor change in the Work, or (2) a Change Order or Construction Change Directive has been issued authorizing the deviation. The Contractor shall not be relieved of responsibility for errors or omissions in Shop Drawings, Product Data, Samples or similar submittals by the Architect's approval thereof.

§ 3.12.9 The Contractor shall direct specific attention, in writing or on resubmitted Shop Drawings, Product Data, Samples or similar submittals, to revisions other than those requested by the Architect on previous submittals. In the absence of such written notice, the Architect's approval of a resubmission shall not apply to such revisions.

§ 3.12.10 The Contractor shall not be required to provide professional services that constitute the practice of architecture or engineering unless such services are specifically required by the Contract Documents for a portion of the Work or unless the Contractor needs to provide such services in order to carry out the Contractor's responsibilities for construction means, methods, techniques, sequences and procedures. The Contractor shall not be required to provide professional services in violation of applicable law. If professional design services or certifications by a design professional related to systems, materials or equipment are specifically required of the Contractor by the Contract Documents, the Owner and the Architect will specify all performance and design criteria that such services must satisfy. The Contractor shall cause such services or certifications to be provided by a properly licensed design professional, whose signature and seal shall appear on all drawings, calculations, specifications, certifications, Shop Drawings and other submittals prepared by such professional. Shop Drawings and other submittals related to the Work designed or certified by such professional, if prepared by others, shall bear such professional's written approval when submitted to the Architect. The Owner and the Architect shall be entitled to rely upon the adequacy, accuracy and

completeness of the services, certifications and approvals performed or provided by such design professionals, provided the Owner and Architect have specified to the Contractor all performance and design criteria that such services must satisfy. Pursuant to this Section 3.12.10, the Architect will review, approve or take other appropriate action on submittals only for the limited purpose of checking for conformance with information given and the design concept expressed in the Contract Documents. The Contractor shall not be responsible for the adequacy of the performance and design criteria specified in the Contract Documents.

§ 3.13 USE OF SITE

The Contractor shall confine operations at the site to areas permitted by applicable laws, statutes, ordinances, codes, rules and regulations, and lawful orders of public authorities and the Contract Documents and shall not unreasonably encumber the site with materials or equipment.

§ 3.14 CUTTING AND PATCHING

§ 3.14.1 The Contractor shall be responsible for cutting, fitting or patching required to complete the Work or to make its parts fit together properly. All areas requiring cutting, fitting and patching shall be restored to the condition existing prior to the cutting, fitting and patching, unless otherwise required by the Contract Documents.

§ 3.14.2 The Contractor shall not damage or endanger a portion of the Work or fully or partially completed construction of the Owner or separate contractors by cutting, patching or otherwise altering such construction, or by excavation. The Contractor shall not cut or otherwise alter such construction by the Owner or a separate contractor except with written consent of the Owner and of such separate contractor; such consent shall not be unreasonably withheld. The Contractor shall not unreasonably withhold from the Owner or a separate contractor the Contractor's consent to cutting or otherwise altering the Work.

§ 3.15 CLEANING UP

§ 3.15.1 The Contractor shall keep the premises and surrounding area free from accumulation of waste materials or rubbish caused by operations under the Contract. At completion of the Work, the Contractor shall remove waste materials, rubbish, the Contractor's tools, construction equipment, machinery and surplus materials from and about the Project.

§ 3.15.2 If the Contractor fails to clean up as provided in the Contract Documents, the Owner may do so and Owner shall be entitled to reimbursement from the Contractor.

§ 3.16 ACCESS TO WORK

The Contractor shall provide the Owner and Architect access to the Work in preparation and progress wherever located.

§ 3.17 ROYALTIES, PATENTS AND COPYRIGHTS

The Contractor shall pay all royalties and license fees. The Contractor shall defend suits or claims for infringement of copyrights and patent rights and shall hold the Owner and Architect harmless from loss on account thereof, but shall not be responsible for such defense or loss when a particular design, process or product of a particular manufacturer or manufacturers is required by the Contract Documents, or where the copyright violations are contained in Drawings, Specifications or other documents prepared by the Owner or Architect. However, if the Contractor has reason to believe that the required design, process or product is an infringement of a copyright or a patent, the Contractor shall be responsible for such loss unless such information is promptly furnished to the Architect.

§ 3.18 INDEMNIFICATION

§ 3.18.1 To the fullest extent permitted by law the Contractor shall indemnify and hold harmless the Owner, Architect, Architect's consultants, and agents and employees of any of them from and against claims, damages, losses and expenses, including but not limited to attorneys' fees, arising out of or resulting from performance of the Work, provided that such claim, damage, loss or expense is attributable to bodily injury, sickness, disease or death, or to injury to or destruction of tangible property (other than the Work itself), but only to the extent caused by the negligent acts or omissions of the Contractor, a Subcontractor, anyone directly or indirectly employed by them or anyone for whose acts they may be liable, regardless of whether or not such claim, damage, loss or expense is caused in part by a party indemnified hereunder. Such obligation shall not be construed to negate, abridge, or reduce other rights or obligations of indemnity which would otherwise exist as to a party or person described in this Section 3.18.

§ 3.18.2 In claims against any person or entity indemnified under this Section 3.18 by an employee of the Contractor, a Subcontractor, anyone directly or indirectly employed by them or anyone for whose acts they may be liable, the indemnification obligation under Section 3.18.1 shall not be limited by a limitation on amount or type of damages, compensation or benefits payable by or for the Contractor or a Subcontractor under workers' compensation acts, disability benefit acts or other employee benefit acts.

ARTICLE 4 ARCHITECT

§ 4.1 GENERAL

§ 4.1.1 The Owner shall retain an architect lawfully licensed to practice architecture or an entity lawfully practicing architecture in the jurisdiction where the Project is located. That person or entity is identified as the Architect in the Agreement and is referred to throughout the Contract Documents as if singular in number.

§ 4.1.2 Duties, responsibilities and limitations of authority of the Architect as set forth in the Contract Documents shall not be restricted, modified or extended without written consent of the Owner, Contractor and Architect. Consent shall not be unreasonably withheld.

§ 4.1.3 If the employment of the Architect is terminated, the Owner shall employ a successor architect as to whom the Contractor has no reasonable objection and whose status under the Contract Documents shall be that of the Architect.

§ 4.2 ADMINISTRATION OF THE CONTRACT

§ 4.2.1 The Architect will provide administration of the Contract as described in the Contract Documents and will be an Owner's representative during construction until the date the Architect issues the final Certificate For Payment. The Architect will have authority to act on behalf of the Owner only to the extent provided in the Contract Documents.

§ 4.2.2 The Architect will visit the site at intervals appropriate to the stage of construction, or as otherwise agreed with the Owner, to become generally familiar with the progress and quality of the portion of the Work completed, and to determine in general if the Work observed is being performed in a manner indicating that the Work, when fully completed, will be in accordance with the Contract Documents. However, the Architect will not be required to make exhaustive or continuous on-site inspections to check the quality or quantity of the Work. The Architect will not have control over, charge of, or responsibility for, the construction means, methods, techniques, sequences or procedures, or for the safety precautions and programs in connection with the Work, since these are solely the Contractor's rights and responsibilities under the Contract Documents, except as provided in Section 3.3.1.

§ 4.2.3 On the basis of the site visits, the Architect will keep the Owner reasonably informed about the progress and quality of the portion of the Work completed, and report to the Owner (1) known deviations from the Contract Documents and from the most recent construction schedule submitted by the Contractor, and (2) defects and deficiencies observed in the Work. The Architect will not be responsible for the Contractor's failure to perform the Work in accordance with the requirements of the Contract Documents. The Architect will not have control over or charge of and will not be responsible for acts or omissions of the Contractor, Subcontractors, or their agents or employees, or any other persons or entities performing portions of the Work.

§ 4.2.4 COMMUNICATIONS FACILITATING CONTRACT ADMINISTRATION

Except as otherwise provided in the Contract Documents or when direct communications have been specially authorized, the Owner and Contractor shall endeavor to communicate with each other through the Architect about matters arising out of or relating to the Contract. Communications by and with the Architect's consultants shall be through the Architect. Communications by and with Subcontractors and material suppliers shall be through the Contractor. Communications by and with separate contractors shall be through the Owner.

§ 4.2.5 Based on the Architect's evaluations of the Contractor's Applications for Payment, the Architect will review and certify the amounts due the Contractor and will issue Certificates for Payment in such amounts.

§ 4.2.6 The Architect has authority to reject Work that does not conform to the Contract Documents. Whenever the Architect considers it necessary or advisable, the Architect will have authority to require inspection or testing of the Work in accordance with Sections 13.5.2 and 13.5.3, whether or not such Work is fabricated, installed or completed. However, neither this authority of the Architect nor a decision made in good faith either to exercise or not to exercise such authority shall give rise to a duty or responsibility of the Architect to the Contractor, Subcontractors, material and equipment suppliers, their agents or employees, or other persons or entities performing portions of the Work.

§ 4.2.7 The Architect will review and approve, or take other appropriate action upon, the Contractor's submittals such as Shop Drawings, Product Data and Samples, but only for the limited purpose of checking for conformance with information given and the design concept expressed in the Contract Documents. The Architect's action will be taken in accordance with the submittal schedule approved by the Architect or, in the absence of an approved submittal schedule, with reasonable promptness while allowing sufficient time in the Architect's professional judgment to permit adequate review. Review of such submittals is not conducted for the purpose of determining the accuracy and completeness of other details such as dimensions and quantities, or for substantiating instructions for installation or performance of equipment or systems, all of which remain the responsibility of the Contractor as required by the Contract Documents. The Architect's review of the Contractor's submittals shall not relieve the Contractor of the obligations under Sections 3.3, 3.5 and 3.12. The Architect's review shall not constitute approval of safety precautions or, unless otherwise specifically stated by the Architect, of any construction means, methods, techniques, sequences or procedures. The Architect's approval of a specific item shall not indicate approval of an assembly of which the item is a component.

§ 4.2.8 The Architect will prepare Change Orders and Construction Change Directives, and may authorize minor changes in the Work as provided in Section 7.4. The Architect will investigate and make determinations and recommendations regarding concealed and unknown conditions as provided in Section 3.7.4.

§ 4.2.9 The Architect will conduct inspections to determine the date or dates of Substantial Completion and the date of final completion; issue Certificates of Substantial Completion pursuant to Section 9.8; receive and forward to the Owner, for the Owner's review and records, written warranties and related documents required by the Contract and assembled by the Contractor pursuant to Section 9.10; and issue a final Certificate for Payment pursuant to Section 9.10.

§ 4.2.10 If the Owner and Architect agree, the Architect will provide one or more project representatives to assist in carrying out the Architect's responsibilities at the site. The duties, responsibilities and limitations of authority of such project representatives shall be as set forth in an exhibit to be incorporated in the Contract Documents.

§ 4.2.11 The Architect will interpret and decide matters concerning performance under, and requirements of, the Contract Documents on written request of either the Owner or Contractor. The Architect's response to such requests will be made in writing within any time limits agreed upon or otherwise with reasonable promptness.

§ 4.2.12 Interpretations and decisions of the Architect will be consistent with the intent of, and reasonably inferable from, the Contract Documents and will be in writing or in the form of drawings. When making such interpretations and decisions, the Architect will endeavor to secure faithful performance by both Owner and Contractor, will not show partiality to either and will not be liable for results of interpretations or decisions rendered in good faith.

§ 4.2.13 The Architect's decisions on matters relating to aesthetic effect will be final if consistent with the intent expressed in the Contract Documents.

§ 4.2.14 The Architect will review and respond to requests for information about the Contract Documents. The Architect's response to such requests will be made in writing within any time limits agreed upon or otherwise with reasonable promptness. If appropriate, the Architect will prepare and issue supplemental Drawings and Specifications in response to the requests for information.

ARTICLE 5 SUBCONTRACTORS

§ 5.1 DEFINITIONS

§ 5.1.1 A Subcontractor is a person or entity who has a direct contract with the Contractor to perform a portion of the Work at the site. The term "Subcontractor" is referred to throughout the Contract Documents as if singular in number and means a Subcontractor or an authorized representative of the Subcontractor. The term "Subcontractor" does not include a separate contractor or subcontractors of a separate contractor.

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

§ 5.2 AWARD OF SUBCONTRACTS AND OTHER CONTRACTS FOR PORTIONS OF THE WORK

§ 5.2.1 Unless otherwise stated in the Contract Documents or the bidding requirements, the Contractor, as soon as practicable after award of the Contract, shall furnish in writing to the Owner through the Architect the names of persons or entities (including those who are to furnish materials or equipment fabricated to a special design) proposed for each principal portion of the Work. The Architect may reply within 14 days to the Contractor in writing stating (1) whether the Owner or the Architect has reasonable objection to any such proposed person or entity or (2) that the Architect requires additional time for review. Failure of the Owner or Architect to reply within the 14 day period shall constitute notice of no reasonable objection.

§ 5.2.2 The Contractor shall not contract with a proposed person or entity to whom the Owner or Architect has made reasonable and timely objection. The Contractor shall not be required to contract with anyone to whom the Contractor has made reasonable objection.

§ 5.2.3 If the Owner or Architect has reasonable objection to a person or entity proposed by the Contractor, the Contractor shall propose another to whom the Owner or Architect has no reasonable objection. If the proposed but rejected Subcontractor was reasonably capable of performing the Work, the Contract Sum and Contract Time shall be increased or decreased by the difference, if any, occasioned by such change, and an appropriate Change Order shall be issued before commencement of the substitute Subcontractor's Work. However, no increase in the Contract Sum or Contract Time shall be allowed for such change unless the Contractor has acted promptly and responsively in submitting names as required.

§ 5.2.4 The Contractor shall not substitute a Subcontractor, person or entity previously selected if the Owner or Architect makes reasonable objection to such substitution.

§ 5.3 SUBCONTRACTUAL RELATIONS

By appropriate agreement, written where legally required for validity, the Contractor shall require each Subcontractor, to the extent of the Work to be performed by the Subcontractor, to be bound to the Contractor by terms of the Contract Documents, and to assume toward the Contractor all the obligations and responsibilities, including the responsibility for safety of the Subcontractor's Work, which the Contractor, by these Documents, assumes toward the Owner and Architect. Each subcontract agreement shall preserve and protect the rights of the Owner and Architect under the Contract Documents with respect to the Work to be performed by the Subcontractor so that subcontracting thereof will not prejudice such rights, and shall allow to the Subcontractor, unless specifically provided otherwise in the subcontract agreement, the benefit of all rights, remedies and redress against the Contractor that the Contractor, by the Contract Documents, has against the Owner. Where appropriate, the Contractor shall require each Subcontractor to enter into similar agreements with Sub-subcontractors. The Contractor shall make available to each proposed Subcontractor, prior to the execution of the subcontract agreement, copies of the Contract Documents to which the Subcontractor will be bound, and, upon written request of the Subcontractor, identify to the Subcontractor terms and conditions of the proposed subcontract agreement that may be at variance with the Contract Documents. Subcontractors will similarly make copies of applicable portions of such documents available to their respective proposed Sub-subcontractors.

§ 5.4 CONTINGENT ASSIGNMENT OF SUBCONTRACTS

§ 5.4.1 Each subcontract agreement for a portion of the Work is assigned by the Contractor to the Owner, provided that

- .1 assignment is effective only after termination of the Contract by the Owner for cause pursuant to Section 14.2 and only for those subcontract agreements that the Owner accepts by notifying the Subcontractor and Contractor in writing; and
- .2 assignment is subject to the prior rights of the surety, if any, obligated under bond relating to the Contract.

When the Owner accepts the assignment of a subcontract agreement, the Owner assumes the Contractor's rights and obligations under the subcontract.

§ 5.4.2 Upon such assignment, if the Work has been suspended for more than 30 days, the Subcontractor's compensation shall be equitably adjusted for increases in cost resulting from the suspension.

§ 5.4.3 Upon such assignment to the Owner under this Section 5.4, the Owner may further assign the subcontract to a successor contractor or other entity. If the Owner assigns the subcontract to a successor contractor or other entity, the

Owner shall nevertheless remain legally responsible for all of the successor contractor's obligations under the subcontract.

ARTICLE 6 CONSTRUCTION BY OWNER OR BY SEPARATE CONTRACTORS

§ 6.1 OWNER'S RIGHT TO PERFORM CONSTRUCTION AND TO AWARD SEPARATE CONTRACTS

§ 6.1.1 The Owner reserves the right to perform construction or operations related to the Project with the Owner's own forces, and to award separate contracts in connection with other portions of the Project or other construction or operations on the site under Conditions of the Contract identical or substantially similar to these including those portions related to insurance and waiver of subrogation. If the Contractor claims that delay or additional cost is involved because of such action by the Owner, the Contractor shall make such Claim as provided in Article 15.

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

§ 6.1.3 The Owner shall provide for coordination of the activities of the Owner's own forces and of each separate contractor with the Work of the Contractor, who shall cooperate with them. The Contractor shall participate with other separate contractors and the Owner in reviewing their construction schedules. The Contractor shall make any revisions to the construction schedule deemed necessary after a joint review and mutual agreement. The construction schedules shall then constitute the schedules to be used by the Contractor, separate contractors and the Owner until subsequently revised.

§ 6.1.4 Unless otherwise provided in the Contract Documents, when the Owner performs construction or operations related to the Project with the Owner's own forces, the Owner shall be deemed to be subject to the same obligations and to have the same rights that apply to the Contractor under the Conditions of the Contract, including, without excluding others, those stated in Article 3, this Article 6 and Articles 10, 11 and 12.

§ 6.2 MUTUAL RESPONSIBILITY

§ 6.2.1 The Contractor shall afford the Owner and separate contractors reasonable opportunity for introduction and storage of their materials and equipment and performance of their activities, and shall connect and coordinate the Contractor's construction and operations with theirs as required by the Contract Documents.

§ 6.2.2 If part of the Contractor's Work depends for proper execution or results upon construction or operations by the Owner or a separate contractor, the Contractor shall, prior to proceeding with that portion of the Work, promptly report to the Architect apparent discrepancies or defects in such other construction that would render it unsuitable for such proper execution and results. Failure of the Contractor so to report shall constitute an acknowledgment that the Owner's or separate contractor's completed or partially completed construction is fit and proper to receive the Contractor's Work, except as to defects not then reasonably discoverable.

§ 6.2.3 The Contractor shall reimburse the Owner for costs the Owner incurs that are payable to a separate contractor because of the Contractor's delays, improperly timed activities or defective construction. The Owner shall be responsible to the Contractor for costs the Contractor incurs because of a separate contractor's delays, improperly timed activities, damage to the Work or defective construction.

§ 6.2.4 The Contractor shall promptly remedy damage the Contractor wrongfully causes to completed or partially completed construction or to property of the Owner or separate contractors as provided in Section 10.2.5.

§ 6.2.5 The Owner and each separate contractor shall have the same responsibilities for cutting and patching as are described for the Contractor in Section 3.14.

§ 6.3 OWNER'S RIGHT TO CLEAN UP

If a dispute arises among the Contractor, separate contractors and the Owner as to the responsibility under their respective contracts for maintaining the premises and surrounding area free from waste materials and rubbish, the Owner may clean up and the Architect will allocate the cost among those responsible.

ARTICLE 7 CHANGES IN THE WORK

§ 7.1 GENERAL

§ 7.1.1 Changes in the Work may be accomplished after execution of the Contract, and without invalidating the Contract, by Change Order, Construction Change Directive or order for a minor change in the Work, subject to the limitations stated in this Article 7 and elsewhere in the Contract Documents.

§ 7.1.2 A Change Order shall be based upon agreement among the Owner, Contractor and Architect; a Construction Change Directive requires agreement by the Owner and Architect and may or may not be agreed to by the Contractor; an order for a minor change in the Work may be issued by the Architect alone.

§ 7.1.3 Changes in the Work shall be performed under applicable provisions of the Contract Documents, and the Contractor shall proceed promptly, unless otherwise provided in the Change Order, Construction Change Directive or order for a minor change in the Work.

§ 7.2 CHANGE ORDERS

§ 7.2.1 A Change Order is a written instrument prepared by the Architect and signed by the Owner, Contractor and Architect stating their agreement upon all of the following:

- .1 The change in the Work;
- .2 The amount of the adjustment, if any, in the Contract Sum; and
- .3 The extent of the adjustment, if any, in the Contract Time.

§ 7.3 CONSTRUCTION CHANGE DIRECTIVES

§ 7.3.1 A Construction Change Directive is a written order prepared by the Architect and signed by the Owner and Architect, directing a change in the Work prior to agreement on adjustment, if any, in the Contract Sum or Contract Time, or both. The Owner may by Construction Change Directive, without invalidating the Contract, order changes in the Work within the general scope of the Contract consisting of additions, deletions or other revisions, the Contract Sum and Contract Time being adjusted accordingly.

§ 7.3.2 A Construction Change Directive shall be used in the absence of total agreement on the terms of a Change Order.

§ 7.3.3 If the Construction Change Directive provides for an adjustment to the Contract Sum, the adjustment shall be based on one of the following methods:

- .1 Mutual acceptance of a lump sum properly itemized and supported by sufficient substantiating data to permit evaluation;
- .2 Unit prices stated in the Contract Documents or subsequently agreed upon;
- .3 Cost to be determined in a manner agreed upon by the parties and a mutually acceptable fixed or percentage fee; or
- .4 As provided in Section 7.3.7.

§ 7.3.4 If unit prices are stated in the Contract Documents or subsequently agreed upon, and if quantities originally contemplated are materially changed in a proposed Change Order or Construction Change Directive so that application of such unit prices to quantities of Work proposed will cause substantial inequity to the Owner or Contractor, the applicable unit prices shall be equitably adjusted.

§ 7.3.5 Upon receipt of a Construction Change Directive, the Contractor shall promptly proceed with the change in the Work involved and advise the Architect of the Contractor's agreement or disagreement with the method, if any, provided in the Construction Change Directive for determining the proposed adjustment in the Contract Sum or Contract Time.

§ 7.3.6 A Construction Change Directive signed by the Contractor indicates the Contractor's agreement therewith, including adjustment in Contract Sum and Contract Time or the method for determining them. Such agreement shall be effective immediately and shall be recorded as a Change Order.

§ 7.3.7 If the Contractor does not respond promptly or disagrees with the method for adjustment in the Contract Sum, the Architect shall determine the method and the adjustment on the basis of reasonable expenditures and savings of those performing the Work attributable to the change, including, in case of an increase in the Contract Sum, an amount

for overhead and profit as set forth in the Agreement, or if no such amount is set forth in the Agreement, a reasonable amount. In such case, and also under Section 7.3.3.3, the Contractor shall keep and present, in such form as the Architect may prescribe, an itemized accounting together with appropriate supporting data. Unless otherwise provided in the Contract Documents, costs for the purposes of this Section 7.3.7 shall be limited to the following:

- .1 Costs of labor, including social security, old age and unemployment insurance, fringe benefits required by agreement or custom, and workers' compensation insurance;
- .2 Costs of materials, supplies and equipment, including cost of transportation, whether incorporated or consumed;
- .3 Rental costs of machinery and equipment, exclusive of hand tools, whether rented from the Contractor or others;
- .4 Costs of premiums for all bonds and insurance, permit fees, and sales, use or similar taxes related to the Work; and
- .5 Additional costs of supervision and field office personnel directly attributable to the change.

§ 7.3.8 The amount of credit to be allowed by the Contractor to the Owner for a deletion or change that results in a net decrease in the Contract Sum shall be actual net cost as confirmed by the Architect. When both additions and credits covering related Work or substitutions are involved in a change, the allowance for overhead and profit shall be figured on the basis of net increase, if any, with respect to that change.

§ 7.3.9 Pending final determination of the total cost of a Construction Change Directive to the Owner, the Contractor may request payment for Work completed under the Construction Change Directive in Applications for Payment. The Architect will make an interim determination for purposes of monthly certification for payment for those costs and certify for payment the amount that the Architect determines, in the Architect's professional judgment, to be reasonably justified. The Architect's interim determination of cost shall adjust the Contract Sum on the same basis as a Change Order, subject to the right of either party to disagree and assert a Claim in accordance with Article 15.

§ 7.3.10 When the Owner and Contractor agree with a determination made by the Architect concerning the adjustments in the Contract Sum and Contract Time, or otherwise reach agreement upon the adjustments, such agreement shall be effective immediately and the Architect will prepare a Change Order. Change Orders may be issued for all or any part of a Construction Change Directive.

§ 7.4 MINOR CHANGES IN THE WORK

The Architect has authority to order minor changes in the Work not involving adjustment in the Contract Sum or extension of the Contract Time and not inconsistent with the intent of the Contract Documents. Such changes will be effected by written order signed by the Architect and shall be binding on the Owner and Contractor.

ARTICLE 8 TIME

§ 8.1 DEFINITIONS

§ 8.1.1 Unless otherwise provided, Contract Time is the period of time, including authorized adjustments, allotted in the Contract Documents for Substantial Completion of the Work.

§ 8.1.2 The date of commencement of the Work is the date established in the Agreement.

§ 8.1.3 The date of Substantial Completion is the date certified by the Architect in accordance with Section 9.8.

§ 8.1.4 The term "day" as used in the Contract Documents shall mean calendar day unless otherwise specifically defined.

§ 8.2 PROGRESS AND COMPLETION

§ 8.2.1 Time limits stated in the Contract Documents are of the essence of the Contract. By executing the Agreement the Contractor confirms that the Contract Time is a reasonable period for performing the Work.

§ 8.2.2 The Contractor shall not knowingly, except by agreement or instruction of the Owner in writing, prematurely commence operations on the site or elsewhere prior to the effective date of insurance required by Article 11 to be furnished by the Contractor and Owner. The date of commencement of the Work shall not be changed by the effective date of such insurance.

§ 8.2.3 The Contractor shall proceed expeditiously with adequate forces and shall achieve Substantial Completion within the Contract Time.

§ 8.3 DELAYS AND EXTENSIONS OF TIME

§ 8.3.1 If the Contractor is delayed at any time in the commencement or progress of the Work by an act or neglect of the Owner or Architect, or of an employee of either, or of a separate contractor employed by the Owner; or by changes ordered in the Work; or by labor disputes, fire, unusual delay in deliveries, unavoidable casualties or other causes beyond the Contractor's control; or by delay authorized by the Owner pending mediation and arbitration; or by other causes that the Architect determines may justify delay, then the Contract Time shall be extended by Change Order for such reasonable time as the Architect may determine.

§ 8.3.2 Claims relating to time shall be made in accordance with applicable provisions of Article 15.

§ 8.3.3 This Section 8.3 does not preclude recovery of damages for delay by either party under other provisions of the Contract Documents.

ARTICLE 9 PAYMENTS AND COMPLETION

§ 9.1 CONTRACT SUM

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

§ 9.2 SCHEDULE OF VALUES

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

§ 9.3 APPLICATIONS FOR PAYMENT

§ 9.3.1 At least ten days before the date established for each progress payment, the Contractor shall submit to the Architect an itemized Application for Payment prepared in accordance with the schedule of values, if required under Section 9.2., for completed portions of the Work. Such application shall be notarized, if required, and supported by such data substantiating the Contractor's right to payment as the Owner or Architect may require, such as copies of requisitions from Subcontractors and material suppliers, and shall reflect retainage if provided for in the Contract Documents.

§ 9.3.1.1 As provided in Section 7.3.9, such applications may include requests for payment on account of changes in the Work that have been properly authorized by Construction Change Directives, or by interim determinations of the Architect, but not yet included in Change Orders.

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

§ 9.3.2 Unless otherwise provided in the Contract Documents, payments shall be made on account of materials and equipment delivered and suitably stored at the site for subsequent incorporation in the Work. If approved in advance by the Owner, payment may similarly be made for materials and equipment suitably stored off the site at a location agreed upon in writing. Payment for materials and equipment stored on or off the site shall be conditioned upon compliance by the Contractor with procedures satisfactory to the Owner to establish the Owner's title to such materials and equipment or otherwise protect the Owner's interest, and shall include the costs of applicable insurance, storage and transportation to the site for such materials and equipment stored off the site.

§ 9.3.3 The Contractor warrants that title to all Work covered by an Application for Payment will pass to the Owner no later than the time of payment. The Contractor further warrants that upon submittal of an Application for Payment all Work for which Certificates for Payment have been previously issued and payments received from the Owner shall, to the best of the Contractor's knowledge, information and belief, be free and clear of liens, claims, security interests or

encumbrances in favor of the Contractor, Subcontractors, material suppliers, or other persons or entities making a claim by reason of having provided labor, materials and equipment relating to the Work.

§ 9.4 CERTIFICATES FOR PAYMENT

§ 9.4.1 The Architect will, within seven days after receipt of the Contractor's Application for Payment, either issue to the Owner a Certificate for Payment, with a copy to the Contractor, for such amount as the Architect determines is properly due, or notify the Contractor and Owner in writing of the Architect's reasons for withholding certification in whole or in part as provided in Section 9.5.1.

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

§ 9.5 DECISIONS TO WITHHOLD CERTIFICATION

§ 9.5.1 The Architect may withhold a Certificate for Payment in whole or in part, to the extent reasonably necessary to protect the Owner, if in the Architect's opinion the representations to the Owner required by Section 9.4.2 cannot be made. If the Architect is unable to certify payment in the amount of the Application, the Architect will notify the Contractor and Owner as provided in Section 9.4.1. If the Contractor and Architect cannot agree on a revised amount, the Architect will promptly issue a Certificate for Payment for the amount for which the Architect is able to make such representations to the Owner. The Architect may also withhold a Certificate for Payment or, because of subsequently discovered evidence, may nullify the whole or a part of a Certificate for Payment previously issued, to such extent as may be necessary in the Architect's opinion to protect the Owner from loss for which the Contractor is responsible, including loss resulting from acts and omissions described in Section 3.3.2, because of

- .1 defective Work not remedied;
- .2 third party claims filed or reasonable evidence indicating probable filing of such claims unless security acceptable to the Owner is provided by the Contractor;
- .3 failure of the Contractor to make payments properly to Subcontractors or for labor, materials or equipment;
- .4 reasonable evidence that the Work cannot be completed for the unpaid balance of the Contract Sum;
- .5 damage to the Owner or a separate contractor;
- .6 reasonable evidence that the Work will not be completed within the Contract Time, and that the unpaid balance would not be adequate to cover actual or liquidated damages for the anticipated delay; or
- .7 repeated failure to carry out the Work in accordance with the Contract Documents.

§ 9.5.2 When the above reasons for withholding certification are removed, certification will be made for amounts previously withheld.

§ 9.5.3 If the Architect withholds certification for payment under Section 9.5.1.3, the Owner may, at its sole option, issue joint checks to the Contractor and to any Subcontractor or material or equipment suppliers to whom the Contractor failed to make payment for Work properly performed or material or equipment suitably delivered. If the Owner makes payments by joint check, the Owner shall notify the Architect and the Architect will reflect such payment on the next Certificate for Payment.

§ 9.6 PROGRESS PAYMENTS

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

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

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

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

§ 9.6.5 Contractor payments to material and equipment suppliers shall be treated in a manner similar to that provided in Sections 9.6.2, 9.6.3 and 9.6.4.

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

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

§ 9.7 FAILURE OF PAYMENT

If the Architect does not issue a Certificate for Payment, through no fault of the Contractor, within seven days after receipt of the Contractor's Application for Payment, or if the Owner does not pay the Contractor within seven days after the date established in the Contract Documents the amount certified by the Architect or awarded by binding dispute resolution, then the Contractor may, upon seven additional days' written notice to the Owner and Architect, stop the Work until payment of the amount owing has been received. The Contract Time shall be extended appropriately and the Contract Sum shall be increased by the amount of the Contractor's reasonable costs of shut-down, delay and start-up, plus interest as provided for in the Contract Documents.

§ 9.8 SUBSTANTIAL COMPLETION

§ 9.8.1 Substantial Completion is the stage in the progress of the Work when the Work or designated portion thereof is sufficiently complete in accordance with the Contract Documents so that the Owner can occupy or utilize the Work for its intended use.

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

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

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

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

§ 9.9 PARTIAL OCCUPANCY OR USE

§ 9.9.1 The Owner may occupy or use any completed or partially completed portion of the Work at any stage when such portion is designated by separate agreement with the Contractor, provided such occupancy or use is consented to by the insurer as required under Section 11.3.1.5 and authorized by public authorities having jurisdiction over the Project. Such partial occupancy or use may commence whether or not the portion is substantially complete, provided the Owner and Contractor have accepted in writing the responsibilities assigned to each of them for payments, retainage, if any, security, maintenance, heat, utilities, damage to the Work and insurance, and have agreed in writing concerning the period for correction of the Work and commencement of warranties required by the Contract Documents. When the Contractor considers a portion substantially complete, the Contractor shall prepare and submit a list to the Architect as provided under Section 9.8.2. Consent of the Contractor to partial occupancy or use shall not be unreasonably withheld. The stage of the progress of the Work shall be determined by written agreement between the Owner and Contractor or, if no agreement is reached, by decision of the Architect.

§ 9.9.2 Immediately prior to such partial occupancy or use, the Owner, Contractor and Architect shall jointly inspect the area to be occupied or portion of the Work to be used in order to determine and record the condition of the Work.

§ 9.9.3 Unless otherwise agreed upon, partial occupancy or use of a portion or portions of the Work shall not constitute acceptance of Work not complying with the requirements of the Contract Documents.

§ 9.10 FINAL COMPLETION AND FINAL PAYMENT

§ 9.10.1 Upon receipt of the Contractor's written notice that the Work is ready for final inspection and acceptance and upon receipt of a final Application for Payment, the Architect will promptly make such inspection and, when the Architect finds the Work acceptable under the Contract Documents and the Contract fully performed, the Architect will promptly issue a final Certificate for Payment stating that to the best of the Architect's knowledge, information and belief, and on the basis of the Architect's on-site visits and inspections, the Work has been completed in accordance with terms and conditions of the Contract Documents and that the entire balance found to be due the Contractor and noted in the final Certificate is due and payable. The Architect's final Certificate for Payment will constitute a further representation that conditions listed in Section 9.10.2 as precedent to the Contractor's being entitled to final payment have been fulfilled.

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

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

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

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

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

ARTICLE 10 PROTECTION OF PERSONS AND PROPERTY

§ 10.1 SAFETY PRECAUTIONS AND PROGRAMS

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

§ 10.2 SAFETY OF PERSONS AND PROPERTY

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

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

§ 10.2.2 The Contractor shall comply with and give notices required by applicable laws, statutes, ordinances, codes, rules and regulations, and lawful orders of public authorities bearing on safety of persons or property or their protection from damage, injury or loss.

§ 10.2.3 The Contractor shall erect and maintain, as required by existing conditions and performance of the Contract, reasonable safeguards for safety and protection, including posting danger signs and other warnings against hazards, promulgating safety regulations and notifying owners and users of adjacent sites and utilities.

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

§ 10.2.5 The Contractor shall promptly remedy damage and loss (other than damage or loss insured under property insurance required by the Contract Documents) to property referred to in Sections 10.2.1.2 and 10.2.1.3 caused in whole or in part by the Contractor, a Subcontractor, a Sub-subcontractor, or anyone directly or indirectly employed by any of them, or by anyone for whose acts they may be liable and for which the Contractor is responsible under Sections 10.2.1.2 and 10.2.1.3, except damage or loss attributable to acts or omissions of the Owner or Architect or anyone directly or indirectly employed by either of them, or by anyone for whose acts either of them may be liable, and not attributable to the fault or negligence of the Contractor. The foregoing obligations of the Contractor are in addition to the Contractor's obligations under Section 3.18.

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

§ 10.2.7 The Contractor shall not permit any part of the construction or site to be loaded so as to cause damage or create an unsafe condition.

§ 10.2.8 INJURY OR DAMAGE TO PERSON OR PROPERTY

If either party suffers injury or damage to person or property because of an act or omission of the other party, or of others for whose acts such party is legally responsible, written notice of such injury or damage, whether or not insured, shall be given to the other party within a reasonable time not exceeding 21 days after discovery. The notice shall provide sufficient detail to enable the other party to investigate the matter.

§ 10.3 HAZARDOUS MATERIALS

§ 10.3.1 The Contractor is responsible for compliance with any requirements included in the Contract Documents regarding hazardous materials. If the Contractor encounters a hazardous material or substance not addressed in the Contract Documents and if reasonable precautions will be inadequate to prevent foreseeable bodily injury or death to persons resulting from a material or substance, including but not limited to asbestos or polychlorinated biphenyl (PCB), encountered on the site by the Contractor, the Contractor shall, upon recognizing the condition, immediately stop Work in the affected area and report the condition to the Owner and Architect in writing.

§ 10.3.2 Upon receipt of the Contractor's written notice, the Owner shall obtain the services of a licensed laboratory to verify the presence or absence of the material or substance reported by the Contractor and, in the event such material or substance is found to be present, to cause it to be rendered harmless. Unless otherwise required by the Contract Documents, the Owner shall furnish in writing to the Contractor and Architect the names and qualifications of persons or entities who are to perform tests verifying the presence or absence of such material or substance or who are to perform the task of removal or safe containment of such material or substance. The Contractor and the Architect will promptly reply to the Owner in writing stating whether or not either has reasonable objection to the persons or entities proposed by the Owner. If either the Contractor or Architect has an objection to a person or entity proposed by the Owner, the Owner shall propose another to whom the Contractor and the Architect have no reasonable objection. When the material or substance has been rendered harmless, Work in the affected area shall resume upon written agreement of the Owner and Contractor. By Change Order, the Contract Time shall be extended appropriately and the Contract Sum shall be increased in the amount of the Contractor's reasonable additional costs of shut-down, delay and start-up.

§ 10.3.3 To the fullest extent permitted by law, the Owner shall indemnify and hold harmless the Contractor, Subcontractors, Architect, Architect's consultants and agents and employees of any of them from and against claims, damages, losses and expenses, including but not limited to attorneys' fees, arising out of or resulting from performance of the Work in the affected area if in fact the material or substance presents the risk of bodily injury or death as described in Section 10.3.1 and has not been rendered harmless, provided that such claim, damage, loss or expense is attributable to bodily injury, sickness, disease or death, or to injury to or destruction of tangible property (other than the Work itself), except to the extent that such damage, loss or expense is due to the fault or negligence of the party seeking indemnity.

§ 10.3.4 The Owner shall not be responsible under this Section 10.3 for materials or substances the Contractor brings to the site unless such materials or substances are required by the Contract Documents. The Owner shall be responsible for materials or substances required by the Contract Documents, except to the extent of the Contractor's fault or negligence in the use and handling of such materials or substances.

§ 10.3.5 The Contractor shall indemnify the Owner for the cost and expense the Owner incurs (1) for remediation of a material or substance the Contractor brings to the site and negligently handles, or (2) where the Contractor fails to perform its obligations under Section 10.3.1, except to the extent that the cost and expense are due to the Owner's fault or negligence.

§ 10.3.6 If, without negligence on the part of the Contractor, the Contractor is held liable by a government agency for the cost of remediation of a hazardous material or substance solely by reason of performing Work as required by the Contract Documents, the Owner shall indemnify the Contractor for all cost and expense thereby incurred.

§ 10.4 EMERGENCIES

In an emergency affecting safety of persons or property, the Contractor shall act, at the Contractor's discretion, to prevent threatened damage, injury or loss. Additional compensation or extension of time claimed by the Contractor on account of an emergency shall be determined as provided in Article 15 and Article 7.

ARTICLE 11 INSURANCE AND BONDS

§ 11.1 CONTRACTOR'S LIABILITY INSURANCE

§ 11.1.1 The Contractor shall purchase from and maintain in a company or companies lawfully authorized to do business in the jurisdiction in which the Project is located such insurance as will protect the Contractor from claims set forth below which may arise out of or result from the Contractor's operations and completed operations under the Contract and for which the Contractor may be legally liable, whether such operations be by the Contractor or by a Subcontractor or by anyone directly or indirectly employed by any of them, or by anyone for whose acts any of them may be liable:

- .1 Claims under workers' compensation, disability benefit and other similar employee benefit acts that are applicable to the Work to be performed;
- .2 Claims for damages because of bodily injury, occupational sickness or disease, or death of the Contractor's employees;
- .3 Claims for damages because of bodily injury, sickness or disease, or death of any person other than the Contractor's employees;
- .4 Claims for damages insured by usual personal injury liability coverage;
- .5 Claims for damages, other than to the Work itself, because of injury to or destruction of tangible property, including loss of use resulting therefrom;
- .6 Claims for damages because of bodily injury, death of a person or property damage arising out of ownership, maintenance or use of a motor vehicle;
- .7 Claims for bodily injury or property damage arising out of completed operations; and
- .8 Claims involving contractual liability insurance applicable to the Contractor's obligations under Section 3.18.

§ 11.1.2 The insurance required by Section 11.1.1 shall be written for not less than limits of liability specified in the Contract Documents or required by law, whichever coverage is greater. Coverages, whether written on an occurrence or claims-made basis, shall be maintained without interruption from the date of commencement of the Work until the date of final payment and termination of any coverage required to be maintained after final payment, and, with respect to the Contractor's completed operations coverage, until the expiration of the period for correction of Work or for such other period for maintenance of completed operations coverage as specified in the Contract Documents.

§ 11.1.3 Certificates of insurance acceptable to the Owner shall be filed with the Owner prior to commencement of the Work and thereafter upon renewal or replacement of each required policy of insurance. These certificates and the insurance policies required by this Section 11.1 shall contain a provision that coverages afforded under the policies will not be canceled or allowed to expire until at least 30 days' prior written notice has been given to the Owner. An additional certificate evidencing continuation of liability coverage, including coverage for completed operations, shall be submitted with the final Application for Payment as required by Section 9.10.2 and thereafter upon renewal or replacement of such coverage until the expiration of the time required by Section 11.1.2. Information concerning reduction of coverage on account of revised limits or claims paid under the General Aggregate, or both, shall be furnished by the Contractor with reasonable promptness.

§ 11.1.4 The Contractor shall cause the commercial liability coverage required by the Contract Documents to include (1) the Owner, the Architect and the Architect's Consultants as additional insureds for claims caused in whole or in part by the Contractor's negligent acts or omissions during the Contractor's operations; and (2) the Owner as an additional insured for claims caused in whole or in part by the Contractor's negligent acts or omissions during the Contractor's completed operations.

§ 11.2 OWNER'S LIABILITY INSURANCE

The Owner shall be responsible for purchasing and maintaining the Owner's usual liability insurance.

§ 11.3 PROPERTY INSURANCE

§ 11.3.1 Unless otherwise provided, the Owner shall purchase and maintain, in a company or companies lawfully authorized to do business in the jurisdiction in which the Project is located, property insurance written on a builder's risk "all-risk" or equivalent policy form in the amount of the initial Contract Sum, plus value of subsequent Contract Modifications and cost of materials supplied or installed by others, comprising total value for the entire Project at the site on a replacement cost basis without optional deductibles. Such property insurance shall be maintained, unless otherwise provided in the Contract Documents or otherwise agreed in writing by all persons and entities who are beneficiaries of such insurance, until final payment has been made as provided in Section 9.10 or until no person or entity other than the Owner has an insurable interest in the property required by this Section 11.3 to be covered, whichever is later. This insurance shall include interests of the Owner, the Contractor, Subcontractors and Sub-subcontractors in the Project.

§ 11.3.1.1 Property insurance shall be on an "all-risk" or equivalent policy form and shall include, without limitation, insurance against the perils of fire (with extended coverage) and physical loss or damage including, without duplication of coverage, theft, vandalism, malicious mischief, collapse, earthquake, flood, windstorm, falsework, testing and startup, temporary buildings and debris removal including demolition occasioned by enforcement of any applicable legal requirements, and shall cover reasonable compensation for Architect's and Contractor's services and expenses required as a result of such insured loss.

§ 11.3.1.2 If the Owner does not intend to purchase such property insurance required by the Contract and with all of the coverages in the amount described above, the Owner shall so inform the Contractor in writing prior to commencement of the Work. The Contractor may then effect insurance that will protect the interests of the Contractor, Subcontractors and Sub-subcontractors in the Work, and by appropriate Change Order the cost thereof shall be charged to the Owner. If the Contractor is damaged by the failure or neglect of the Owner to purchase or maintain insurance as described above, without so notifying the Contractor in writing, then the Owner shall bear all reasonable costs properly attributable thereto.

§ 11.3.1.3 If the property insurance requires deductibles, the Owner shall pay costs not covered because of such deductibles.

§ 11.3.1.4 This property insurance shall cover portions of the Work stored off the site, and also portions of the Work in transit.

§ 11.3.1.5 Partial occupancy or use in accordance with Section 9.9 shall not commence until the insurance company or companies providing property insurance have consented to such partial occupancy or use by endorsement or otherwise. The Owner and the Contractor shall take reasonable steps to obtain consent of the insurance company or companies and shall, without mutual written consent, take no action with respect to partial occupancy or use that would cause cancellation, lapse or reduction of insurance.

§ 11.3.2 BOILER AND MACHINERY INSURANCE

The Owner shall purchase and maintain boiler and machinery insurance required by the Contract Documents or by law, which shall specifically cover such insured objects during installation and until final acceptance by the Owner; this insurance shall include interests of the Owner, Contractor, Subcontractors and Sub-subcontractors in the Work, and the Owner and Contractor shall be named insureds.

§ 11.3.3 LOSS OF USE INSURANCE

The Owner, at the Owner's option, may purchase and maintain such insurance as will insure the Owner against loss of use of the Owner's property due to fire or other hazards, however caused. The Owner waives all rights of action against the Contractor for loss of use of the Owner's property, including consequential losses due to fire or other hazards however caused.

§ 11.3.4 If the Contractor requests in writing that insurance for risks other than those described herein or other special causes of loss be included in the property insurance policy, the Owner shall, if possible, include such insurance, and the cost thereof shall be charged to the Contractor by appropriate Change Order.

§ 11.3.5 If during the Project construction period the Owner insures properties, real or personal or both, at or adjacent to the site by property insurance under policies separate from those insuring the Project, or if after final payment

property insurance is to be provided on the completed Project through a policy or policies other than those insuring the Project during the construction period, the Owner shall waive all rights in accordance with the terms of Section 11.3.7 for damages caused by fire or other causes of loss covered by this separate property insurance. All separate policies shall provide this waiver of subrogation by endorsement or otherwise.

§ 11.3.6 Before an exposure to loss may occur, the Owner shall file with the Contractor a copy of each policy that includes insurance coverages required by this Section 11.3. Each policy shall contain all generally applicable conditions, definitions, exclusions and endorsements related to this Project. Each policy shall contain a provision that the policy will not be canceled or allowed to expire, and that its limits will not be reduced, until at least 30 days' prior written notice has been given to the Contractor.

§ 11.3.7 WAIVERS OF SUBROGATION

The Owner and Contractor waive all rights against (1) each other and any of their subcontractors, sub-subcontractors, agents and employees, each of the other, and (2) the Architect, Architect's consultants, separate contractors described in Article 6, if any, and any of their subcontractors, sub-subcontractors, agents and employees, for damages caused by fire or other causes of loss to the extent covered by property insurance obtained pursuant to this Section 11.3 or other property insurance applicable to the Work, except such rights as they have to proceeds of such insurance held by the Owner as fiduciary. The Owner or Contractor, as appropriate, shall require of the Architect, Architect's consultants, separate contractors described in Article 6, if any, and the subcontractors, sub-subcontractors, agents and employees of any of them, by appropriate agreements, written where legally required for validity, similar waivers each in favor of other parties enumerated herein. The policies shall provide such waivers of subrogation by endorsement or otherwise. A waiver of subrogation shall be effective as to a person or entity even though that person or entity would otherwise have a duty of indemnification, contractual or otherwise, did not pay the insurance premium directly or indirectly, and whether or not the person or entity had an insurable interest in the property damaged.

§ 11.3.8 A loss insured under the Owner's property insurance shall be adjusted by the Owner as fiduciary and made payable to the Owner as fiduciary for the insureds, as their interests may appear, subject to requirements of any applicable mortgagee clause and of Section 11.3.10. The Contractor shall pay Subcontractors their just shares of insurance proceeds received by the Contractor, and by appropriate agreements, written where legally required for validity, shall require Subcontractors to make payments to their Sub-subcontractors in similar manner.

§ 11.3.9 If required in writing by a party in interest, the Owner as fiduciary shall, upon occurrence of an insured loss, give bond for proper performance of the Owner's duties. The cost of required bonds shall be charged against proceeds received as fiduciary. The Owner shall deposit in a separate account proceeds so received, which the Owner shall distribute in accordance with such agreement as the parties in interest may reach, or as determined in accordance with the method of binding dispute resolution selected in the Agreement between the Owner and Contractor. If after such loss no other special agreement is made and unless the Owner terminates the Contract for convenience, replacement of damaged property shall be performed by the Contractor after notification of a Change in the Work in accordance with Article 7.

§ 11.3.10 The Owner as fiduciary shall have power to adjust and settle a loss with insurers unless one of the parties in interest shall object in writing within five days after occurrence of loss to the Owner's exercise of this power; if such objection is made, the dispute shall be resolved in the manner selected by the Owner and Contractor as the method of binding dispute resolution in the Agreement. If the Owner and Contractor have selected arbitration as the method of binding dispute resolution, the Owner as fiduciary shall make settlement with insurers or, in the case of a dispute over distribution of insurance proceeds, in accordance with the directions of the arbitrators.

§ 11.4 PERFORMANCE BOND AND PAYMENT BOND

§ 11.4.1 The Owner shall have the right to require the Contractor to furnish bonds covering faithful performance of the Contract and payment of obligations arising thereunder as stipulated in bidding requirements or specifically required in the Contract Documents on the date of execution of the Contract.

§ 11.4.2 Upon the request of any person or entity appearing to be a potential beneficiary of bonds covering payment of obligations arising under the Contract, the Contractor shall promptly furnish a copy of the bonds or shall authorize a copy to be furnished.

ARTICLE 12 UNCOVERING AND CORRECTION OF WORK

§ 12.1 UNCOVERING OF WORK

§ 12.1.1 If a portion of the Work is covered contrary to the Architect's request or to requirements specifically expressed in the Contract Documents, it must, if requested in writing by the Architect, be uncovered for the Architect's examination and be replaced at the Contractor's expense without change in the Contract Time.

§ 12.1.2 If a portion of the Work has been covered that the Architect has not specifically requested to examine prior to its being covered, the Architect may request to see such Work and it shall be uncovered by the Contractor. If such Work is in accordance with the Contract Documents, costs of uncovering and replacement shall, by appropriate Change Order, be at the Owner's expense. If such Work is not in accordance with the Contract Documents, such costs and the cost of correction shall be at the Contractor's expense unless the condition was caused by the Owner or a separate contractor in which event the Owner shall be responsible for payment of such costs.

§ 12.2 CORRECTION OF WORK

§ 12.2.1 BEFORE OR AFTER SUBSTANTIAL COMPLETION

The Contractor shall promptly correct Work rejected by the Architect or failing to conform to the requirements of the Contract Documents, whether discovered before or after Substantial Completion and whether or not fabricated, installed or completed. Costs of correcting such rejected Work, including additional testing and inspections, the cost of uncovering and replacement, and compensation for the Architect's services and expenses made necessary thereby, shall be at the Contractor's expense.

§ 12.2.2 AFTER SUBSTANTIAL COMPLETION

§ 12.2.2.1 In addition to the Contractor's obligations under Section 3.5, if, within one year after the date of Substantial Completion of the Work or designated portion thereof or after the date for commencement of warranties established under Section 9.9.1, or by terms of an applicable special warranty required by the Contract Documents, any of the Work is found to be not in accordance with the requirements of the Contract Documents, the Contractor shall correct it promptly after receipt of written notice from the Owner to do so unless the Owner has previously given the Contractor a written acceptance of such condition. The Owner shall give such notice promptly after discovery of the condition. During the one-year period for correction of Work, if the Owner fails to notify the Contractor and give the Contractor an opportunity to make the correction, the Owner waives the rights to require correction by the Contractor and to make a claim for breach of warranty. If the Contractor fails to correct nonconforming Work within a reasonable time during that period after receipt of notice from the Owner or Architect, the Owner may correct it in accordance with Section 2.4.

§ 12.2.2.2 The one-year period for correction of Work shall be extended with respect to portions of Work first performed after Substantial Completion by the period of time between Substantial Completion and the actual completion of that portion of the Work.

§ 12.2.2.3 The one-year period for correction of Work shall not be extended by corrective Work performed by the Contractor pursuant to this Section 12.2.

§ 12.2.3 The Contractor shall remove from the site portions of the Work that are not in accordance with the requirements of the Contract Documents and are neither corrected by the Contractor nor accepted by the Owner.

§ 12.2.4 The Contractor shall bear the cost of correcting destroyed or damaged construction, whether completed or partially completed, of the Owner or separate contractors caused by the Contractor's correction or removal of Work that is not in accordance with the requirements of the Contract Documents.

§ 12.2.5 Nothing contained in this Section 12.2 shall be construed to establish a period of limitation with respect to other obligations the Contractor has under the Contract Documents. Establishment of the one-year period for correction of Work as described in Section 12.2.2 relates only to the specific obligation of the Contractor to correct the Work, and has no relationship to the time within which the obligation to comply with the Contract Documents may be sought to be enforced, nor to the time within which proceedings may be commenced to establish the Contractor's liability with respect to the Contractor's obligations other than specifically to correct the Work.

§ 12.3 ACCEPTANCE OF NONCONFORMING WORK

If the Owner prefers to accept Work that is not in accordance with the requirements of the Contract Documents, the Owner may do so instead of requiring its removal and correction, in which case the Contract Sum will be reduced as appropriate and equitable. Such adjustment shall be effected whether or not final payment has been made.

ARTICLE 13 MISCELLANEOUS PROVISIONS

§ 13.1 GOVERNING LAW

The Contract shall be governed by the law of the place where the Project is located except that, if the parties have selected arbitration as the method of binding dispute resolution, the Federal Arbitration Act shall govern Section 15.4.

§ 13.2 SUCCESSORS AND ASSIGNS

§ 13.2.1 The Owner and Contractor respectively bind themselves, their partners, successors, assigns and legal representatives to covenants, agreements and obligations contained in the Contract Documents. Except as provided in Section 13.2.2, neither party to the Contract shall assign the Contract as a whole without written consent of the other. If either party attempts to make such an assignment without such consent, that party shall nevertheless remain legally responsible for all obligations under the Contract.

§ 13.2.2 The Owner may, without consent of the Contractor, assign the Contract to a lender providing construction financing for the Project, if the lender assumes the Owner's rights and obligations under the Contract Documents. The Contractor shall execute all consents reasonably required to facilitate such assignment.

§ 13.3 WRITTEN NOTICE

Written notice shall be deemed to have been duly served if delivered in person to the individual, to a member of the firm or entity, or to an officer of the corporation for which it was intended; or if delivered at, or sent by registered or certified mail or by courier service providing proof of delivery to, the last business address known to the party giving notice.

§ 13.4 RIGHTS AND REMEDIES

§ 13.4.1 Duties and obligations imposed by the Contract Documents and rights and remedies available thereunder shall be in addition to and not a limitation of duties, obligations, rights and remedies otherwise imposed or available by law.

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

§ 13.5 TESTS AND INSPECTIONS

§ 13.5.1 Tests, inspections and approvals of portions of the Work shall be made as required by the Contract Documents and by applicable laws, statutes, ordinances, codes, rules and regulations or lawful orders of public authorities. Unless otherwise provided, the Contractor shall make arrangements for such tests, inspections and approvals with an independent testing laboratory or entity acceptable to the Owner, or with the appropriate public authority, and shall bear all related costs of tests, inspections and approvals. The Contractor shall give the Architect timely notice of when and where tests and inspections are to be made so that the Architect may be present for such procedures. The Owner shall bear costs of (1) tests, inspections or approvals that do not become requirements until after bids are received or negotiations concluded, and (2) tests, inspections or approvals where building codes or applicable laws or regulations prohibit the Owner from delegating their cost to the Contractor.

§ 13.5.2 If the Architect, Owner or public authorities having jurisdiction determine that portions of the Work require additional testing, inspection or approval not included under Section 13.5.1, the Architect will, upon written authorization from the Owner, instruct the Contractor to make arrangements for such additional testing, inspection or approval by an entity acceptable to the Owner, and the Contractor shall give timely notice to the Architect of when and where tests and inspections are to be made so that the Architect may be present for such procedures. Such costs, except as provided in Section 13.5.3, shall be at the Owner's expense.

§ 13.5.3 If such procedures for testing, inspection or approval under Sections 13.5.1 and 13.5.2 reveal failure of the portions of the Work to comply with requirements established by the Contract Documents, all costs made necessary by

such failure including those of repeated procedures and compensation for the Architect's services and expenses shall be at the Contractor's expense.

§ 13.5.4 Required certificates of testing, inspection or approval shall, unless otherwise required by the Contract Documents, be secured by the Contractor and promptly delivered to the Architect.

§ 13.5.5 If the Architect is to observe tests, inspections or approvals required by the Contract Documents, the Architect will do so promptly and, where practicable, at the normal place of testing.

§ 13.5.6 Tests or inspections conducted pursuant to the Contract Documents shall be made promptly to avoid unreasonable delay in the Work.

§ 13.6 INTEREST

Payments due and unpaid under the Contract Documents shall bear interest from the date payment is due at such rate as the parties may agree upon in writing or, in the absence thereof, at the legal rate prevailing from time to time at the place where the Project is located.

§ 13.7 TIME LIMITS ON CLAIMS

The Owner and Contractor shall commence all claims and causes of action, whether in contract, tort, breach of warranty or otherwise, against the other arising out of or related to the Contract in accordance with the requirements of the final dispute resolution method selected in the Agreement within the time period specified by applicable law, but in any case not more than 10 years after the date of Substantial Completion of the Work. The Owner and Contractor waive all claims and causes of action not commenced in accordance with this Section 13.7.

ARTICLE 14 TERMINATION OR SUSPENSION OF THE CONTRACT

§ 14.1 TERMINATION BY THE CONTRACTOR

§ 14.1.1 The Contractor may terminate the Contract if the Work is stopped for a period of 30 consecutive days through no act or fault of the Contractor or a Subcontractor, Sub-subcontractor or their agents or employees or any other persons or entities performing portions of the Work under direct or indirect contract with the Contractor, for any of the following reasons:

- .1 Issuance of an order of a court or other public authority having jurisdiction that requires all Work to be stopped;
- .2 An act of government, such as a declaration of national emergency that requires all Work to be stopped;
- .3 Because the Architect has not issued a Certificate for Payment and has not notified the Contractor of the reason for withholding certification as provided in Section 9.4.1, or because the Owner has not made payment on a Certificate for Payment within the time stated in the Contract Documents; or
- .4 The Owner has failed to furnish to the Contractor promptly, upon the Contractor's request, reasonable evidence as required by Section 2.2.1.

§ 14.1.2 The Contractor may terminate the Contract if, through no act or fault of the Contractor or a Subcontractor, Sub-subcontractor or their agents or employees or any other persons or entities performing portions of the Work under direct or indirect contract with the Contractor, repeated suspensions, delays or interruptions of the entire Work by the Owner as described in Section 14.3 constitute in the aggregate more than 100 percent of the total number of days scheduled for completion, or 120 days in any 365-day period, whichever is less.

§ 14.1.3 If one of the reasons described in Section 14.1.1 or 14.1.2 exists, the Contractor may, upon seven days' written notice to the Owner and Architect, terminate the Contract and recover from the Owner payment for Work executed, including reasonable overhead and profit, costs incurred by reason of such termination, and damages.

§ 14.1.4 If the Work is stopped for a period of 60 consecutive days through no act or fault of the Contractor or a Subcontractor or their agents or employees or any other persons performing portions of the Work under contract with the Contractor because the Owner has repeatedly failed to fulfill the Owner's obligations under the Contract Documents with respect to matters important to the progress of the Work, the Contractor may, upon seven additional days' written notice to the Owner and the Architect, terminate the Contract and recover from the Owner as provided in Section 14.1.3.

§ 14.2 TERMINATION BY THE OWNER FOR CAUSE

§ 14.2.1 The Owner may terminate the Contract if the Contractor

- .1 repeatedly refuses or fails to supply enough properly skilled workers or proper materials;
- .2 fails to make payment to Subcontractors for materials or labor in accordance with the respective agreements between the Contractor and the Subcontractors;
- .3 repeatedly disregards applicable laws, statutes, ordinances, codes, rules and regulations, or lawful orders of a public authority; or
- .4 otherwise is guilty of substantial breach of a provision of the Contract Documents.

§ 14.2.2 When any of the above reasons exist, the Owner, upon certification by the Initial Decision Maker that sufficient cause exists to justify such action, may without prejudice to any other rights or remedies of the Owner and after giving the Contractor and the Contractor's surety, if any, seven days' written notice, terminate employment of the Contractor and may, subject to any prior rights of the surety:

- .1 Exclude the Contractor from the site and take possession of all materials, equipment, tools, and construction equipment and machinery thereon owned by the Contractor;
- .2 Accept assignment of subcontracts pursuant to Section 5.4; and
- .3 Finish the Work by whatever reasonable method the Owner may deem expedient. Upon written request of the Contractor, the Owner shall furnish to the Contractor a detailed accounting of the costs incurred by the Owner in finishing the Work.

§ 14.2.3 When the Owner terminates the Contract for one of the reasons stated in Section 14.2.1, the Contractor shall not be entitled to receive further payment until the Work is finished.

§ 14.2.4 If the unpaid balance of the Contract Sum exceeds costs of finishing the Work, including compensation for the Architect's services and expenses made necessary thereby, and other damages incurred by the Owner and not expressly waived, such excess shall be paid to the Contractor. If such costs and damages exceed the unpaid balance, the Contractor shall pay the difference to the Owner. The amount to be paid to the Contractor or Owner, as the case may be, shall be certified by the Initial Decision Maker, upon application, and this obligation for payment shall survive termination of the Contract.

§ 14.3 SUSPENSION BY THE OWNER FOR CONVENIENCE

§ 14.3.1 The Owner may, without cause, order the Contractor in writing to suspend, delay or interrupt the Work in whole or in part for such period of time as the Owner may determine.

§ 14.3.2 The Contract Sum and Contract Time shall be adjusted for increases in the cost and time caused by suspension, delay or interruption as described in Section 14.3.1. Adjustment of the Contract Sum shall include profit. No adjustment shall be made to the extent

- .1 that performance is, was or would have been so suspended, delayed or interrupted by another cause for which the Contractor is responsible; or
- .2 that an equitable adjustment is made or denied under another provision of the Contract.

§ 14.4 TERMINATION BY THE OWNER FOR CONVENIENCE

§ 14.4.1 The Owner may, at any time, terminate the Contract for the Owner's convenience and without cause.

§ 14.4.2 Upon receipt of written notice from the Owner of such termination for the Owner's convenience, the Contractor shall

- .1 cease operations as directed by the Owner in the notice;
- .2 take actions necessary, or that the Owner may direct, for the protection and preservation of the Work; and
- .3 except for Work directed to be performed prior to the effective date of termination stated in the notice, terminate all existing subcontracts and purchase orders and enter into no further subcontracts and purchase orders.

§ 14.4.3 In case of such termination for the Owner's convenience, the Contractor shall be entitled to receive payment for Work executed, and costs incurred by reason of such termination, along with reasonable overhead and profit on the Work not executed.

ARTICLE 15 CLAIMS AND DISPUTES

§ 15.1 CLAIMS

§ 15.1.1 DEFINITION

A Claim is a demand or assertion by one of the parties seeking, as a matter of right, payment of money, or other relief with respect to the terms of the Contract. The term "Claim" also includes other disputes and matters in question between the Owner and Contractor arising out of or relating to the Contract. The responsibility to substantiate Claims shall rest with the party making the Claim.

§ 15.1.2 NOTICE OF CLAIMS

Claims by either the Owner or Contractor must be initiated by written notice to the other party and to the Initial Decision Maker with a copy sent to the Architect, if the Architect is not serving as the Initial Decision Maker. Claims by either party must be initiated within 21 days after occurrence of the event giving rise to such Claim or within 21 days after the claimant first recognizes the condition giving rise to the Claim, whichever is later.

§ 15.1.3 CONTINUING CONTRACT PERFORMANCE

Pending final resolution of a Claim, except as otherwise agreed in writing or as provided in Section 9.7 and Article 14, the Contractor shall proceed diligently with performance of the Contract and the Owner shall continue to make payments in accordance with the Contract Documents. The Architect will prepare Change Orders and issue Certificates for Payment in accordance with the decisions of the Initial Decision Maker.

§ 15.1.4 CLAIMS FOR ADDITIONAL COST

If the Contractor wishes to make a Claim for an increase in the Contract Sum, written notice as provided herein shall be given before proceeding to execute the Work. Prior notice is not required for Claims relating to an emergency endangering life or property arising under Section 10.4.

§ 15.1.5 CLAIMS FOR ADDITIONAL TIME

§ 15.1.5.1 If the Contractor wishes to make a Claim for an increase in the Contract Time, written notice as provided herein shall be given. The Contractor's Claim shall include an estimate of cost and of probable effect of delay on progress of the Work. In the case of a continuing delay, only one Claim is necessary.

§ 15.1.5.2 If adverse weather conditions are the basis for a Claim for additional time, such Claim shall be documented by data substantiating that weather conditions were abnormal for the period of time, could not have been reasonably anticipated and had an adverse effect on the scheduled construction.

§ 15.1.6 CLAIMS FOR CONSEQUENTIAL DAMAGES

The Contractor and Owner waive Claims against each other for consequential damages arising out of or relating to this Contract. This mutual waiver includes

- .1 damages incurred by the Owner for rental expenses, for losses of use, income, profit, financing, business and reputation, and for loss of management or employee productivity or of the services of such persons; and
- .2 damages incurred by the Contractor for principal office expenses including the compensation of personnel stationed there, for losses of financing, business and reputation, and for loss of profit except anticipated profit arising directly from the Work.

This mutual waiver is applicable, without limitation, to all consequential damages due to either party's termination in accordance with Article 14. Nothing contained in this Section 15.1.6 shall be deemed to preclude an award of liquidated damages, when applicable, in accordance with the requirements of the Contract Documents.

§ 15.2 INITIAL DECISION

§ 15.2.1 Claims, excluding those arising under Sections 10.3, 10.4, 11.3.9, and 11.3.10, shall be referred to the Initial Decision Maker for initial decision. The Architect will serve as the Initial Decision Maker, unless otherwise indicated in the Agreement. Except for those Claims excluded by this Section 15.2.1, an initial decision shall be required as a condition precedent to mediation of any Claim arising prior to the date final payment is due, unless 30 days have passed after the Claim has been referred to the Initial Decision Maker with no decision having been rendered. Unless the Initial Decision Maker and all affected parties agree, the Initial Decision Maker will not decide disputes between the Contractor and persons or entities other than the Owner.

§ 15.2.2 The Initial Decision Maker will review Claims and within ten days of the receipt of a Claim take one or more of the following actions: (1) request additional supporting data from the claimant or a response with supporting data from the other party, (2) reject the Claim in whole or in part, (3) approve the Claim, (4) suggest a compromise, or (5) advise the parties that the Initial Decision Maker is unable to resolve the Claim if the Initial Decision Maker lacks sufficient information to evaluate the merits of the Claim or if the Initial Decision Maker concludes that, in the Initial Decision Maker's sole discretion, it would be inappropriate for the Initial Decision Maker to resolve the Claim.

§ 15.2.3 In evaluating Claims, the Initial Decision Maker may, but shall not be obligated to, consult with or seek information from either party or from persons with special knowledge or expertise who may assist the Initial Decision Maker in rendering a decision. The Initial Decision Maker may request the Owner to authorize retention of such persons at the Owner's expense.

§ 15.2.4 If the Initial Decision Maker requests a party to provide a response to a Claim or to furnish additional supporting data, such party shall respond, within ten days after receipt of such request, and shall either (1) provide a response on the requested supporting data, (2) advise the Initial Decision Maker when the response or supporting data will be furnished or (3) advise the Initial Decision Maker that no supporting data will be furnished. Upon receipt of the response or supporting data, if any, the Initial Decision Maker will either reject or approve the Claim in whole or in part.

§ 15.2.5 The Initial Decision Maker will render an initial decision approving or rejecting the Claim, or indicating that the Initial Decision Maker is unable to resolve the Claim. This initial decision shall (1) be in writing; (2) state the reasons therefor; and (3) notify the parties and the Architect, if the Architect is not serving as the Initial Decision Maker, of any change in the Contract Sum or Contract Time or both. The initial decision shall be final and binding on the parties but subject to mediation and, if the parties fail to resolve their dispute through mediation, to binding dispute resolution.

§ 15.2.6 Either party may file for mediation of an initial decision at any time, subject to the terms of Section 15.2.6.1.

§ 15.2.6.1 Either party may, within 30 days from the date of an initial decision, demand in writing that the other party file for mediation within 60 days of the initial decision. If such a demand is made and the party receiving the demand fails to file for mediation within the time required, then both parties waive their rights to mediate or pursue binding dispute resolution proceedings with respect to the initial decision.

§ 15.2.7 In the event of a Claim against the Contractor, the Owner may, but is not obligated to, notify the surety, if any, of the nature and amount of the Claim. If the Claim relates to a possibility of a Contractor's default, the Owner may, but is not obligated to, notify the surety and request the surety's assistance in resolving the controversy.

§ 15.2.8 If a Claim relates to or is the subject of a mechanic's lien, the party asserting such Claim may proceed in accordance with applicable law to comply with the lien notice or filing deadlines.

§ 15.3 MEDIATION

§ 15.3.1 Claims, disputes, or other matters in controversy arising out of or related to the Contract except those waived as provided for in Sections 9.10.4, 9.10.5, and 15.1.6 shall be subject to mediation as a condition precedent to binding dispute resolution.

§ 15.3.2 The parties shall endeavor to resolve their Claims by mediation which, unless the parties mutually agree otherwise, shall be administered by the American Arbitration Association in accordance with its Construction Industry Mediation Procedures in effect on the date of the Agreement. A request for mediation shall be made in writing, delivered to the other party to the Contract, and filed with the person or entity administering the mediation. The request may be made concurrently with the filing of binding dispute resolution proceedings but, in such event, mediation shall proceed in advance of binding dispute resolution proceedings, which shall be stayed pending mediation for a period of 60 days from the date of filing, unless stayed for a longer period by agreement of the parties or court order. If an arbitration is stayed pursuant to this Section 15.3.2, the parties may nonetheless proceed to the selection of the arbitrator(s) and agree upon a schedule for later proceedings.

§ 15.3.3 The parties shall share the mediator's fee and any filing fees equally. The mediation shall be held in the place where the Project is located, unless another location is mutually agreed upon. Agreements reached in mediation shall be enforceable as settlement agreements in any court having jurisdiction thereof.

§ 15.4 ARBITRATION

§ 15.4.1 If the parties have selected arbitration as the method for binding dispute resolution in the Agreement, any Claim subject to, but not resolved by, mediation shall be subject to arbitration which, unless the parties mutually agree otherwise, shall be administered by the American Arbitration Association in accordance with its Construction Industry Arbitration Rules in effect on the date of the Agreement. A demand for arbitration shall be made in writing, delivered to the other party to the Contract, and filed with the person or entity administering the arbitration. The party filing a notice of demand for arbitration must assert in the demand all Claims then known to that party on which arbitration is permitted to be demanded.

§ 15.4.1.1 A demand for arbitration shall be made no earlier than concurrently with the filing of a request for mediation, but in no event shall it be made after the date when the institution of legal or equitable proceedings based on the Claim would be barred by the applicable statute of limitations. For statute of limitations purposes, receipt of a written demand for arbitration by the person or entity administering the arbitration shall constitute the institution of legal or equitable proceedings based on the Claim.

§ 15.4.2 The award rendered by the arbitrator or arbitrators shall be final, and judgment may be entered upon it in accordance with applicable law in any court having jurisdiction thereof.

§ 15.4.3 The foregoing agreement to arbitrate and other agreements to arbitrate with an additional person or entity duly consented to by parties to the Agreement shall be specifically enforceable under applicable law in any court having jurisdiction thereof.

§ 15.4.4 CONSOLIDATION OR JOINDER

§ 15.4.4.1 Either party, at its sole discretion, may consolidate an arbitration conducted under this Agreement with any other arbitration to which it is a party provided that (1) the arbitration agreement governing the other arbitration permits consolidation, (2) the arbitrations to be consolidated substantially involve common questions of law or fact, and (3) the arbitrations employ materially similar procedural rules and methods for selecting arbitrator(s).

§ 15.4.4.2 Either party, at its sole discretion, may include by joinder persons or entities substantially involved in a common question of law or fact whose presence is required if complete relief is to be accorded in arbitration, provided that the party sought to be joined consents in writing to such joinder. Consent to arbitration involving an additional person or entity shall not constitute consent to arbitration of any claim, dispute or other matter in question not described in the written consent.

§ 15.4.4.3 The Owner and Contractor grant to any person or entity made a party to an arbitration conducted under this Section 15.4, whether by joinder or consolidation, the same rights of joinder and consolidation as the Owner and Contractor under this Agreement.

Additions and Deletions Report for AIA[®] Document A201[™] – 2007

This Additions and Deletions Report, as defined on page 1 of the associated document, reproduces below all text the author has added to the standard form AIA document in order to complete it, as well as any text the author may have added to or deleted from the original AIA text. Added text is shown underlined. Deleted text is indicated with a horizontal line through the original AIA text.

Note: This Additions and Deletions Report is provided for information purposes only and is not incorporated into or constitute any part of the associated AIA document. This Additions and Deletions Report and its associated document were generated simultaneously by AIA software at 09:25:40 on 01/25/2010.

There are no differences.

Certification of Document's Authenticity

AIA® Document D401™ – 2003

I, Douglas S. Barlowe, AIA, hereby certify, to the best of my knowledge, information and belief, that I created the attached final document simultaneously with its associated Additions and Deletions Report and this certification at 09:25:40 on 01/25/2010 under Order No. 1529825392_1 from AIA Contract Documents software and that in preparing the attached final document I made no changes to the original text of AIA® Document A201™ – 2007 - General Conditions of the Contract for Construction, as published by the AIA in its software, other than those additions and deletions shown in the associated Additions and Deletions Report.

(Signed)

(Title)

(Dated)

SECTION 000800 - SUPPLEMENT TO THE AGREEMENT FOR GENERAL CONTRACTOR'S SERVICES

1 Scope

- A. The information and requirements contained in this section are a supplement to and a part of the Agreement for General Contractor's Services.

2 Contract Documents

The term "Contract Documents" includes the following:

1. Leon County Invitation to Bid issued in conjunction with this project.
2. Leon County Agreement for General Contractor's Services issued in conjunction with this project.
3. General conditions of the Contract for Construction, American Institute of Architects Document A201-2007, issued in conjunction with this project.
4. This Supplement to the Agreement for General Contractor's Services.
5. Drawings as enumerated on the Drawings.
6. Specifications as enumerated in the Specifications and/or on the Drawings.

These Contract Documents supersede prior negotiations and agreements.

3 Other Leon County Requirements

- A. Comply with the preferences and requirements listed in the Leon County Facilities Design Guidelines. Copies of this manual are available on the Owner's web site.

4 Modifications to the General Conditions

- A. This Section sets forth modifications to the General Conditions of the Contract for Construction A1A Document A201-2007.

Modify as follows:

Article 1.1.1 Delete its entirety.

Article 2.1.2 Delete its entirety.

Article 2.2.1 Delete its entirety.

Article 3.3.2 - Add the following: "Should the Architect-Engineer find any person(s) employed on the project incompetent, unfit or otherwise objectionable for his duties and so certify the facts to the Contractor, the Contractor shall immediately cause the employee to be dismissed and said employee shall not be re-employed on this project without written consent of the Architect-Engineer."

Article 3.8.1 - Add the following: "If directed by the Architect- Engineer the Contractor shall solicit not less than three bids for the item(s), the cost of which is provided for by a specified allowance sum. The Contractor shall purchase the item(s) from one of the three Bidders as directed by the Architect-Engineer."

SECTION 000800 – SUPPLEMENT TO THE AGREEMENT FOR GENERAL CONTRACTOR’S SERVICES (continued):

Article 3.14.1 - Add the following: "All cutting and patching work shall blend in and be plumb and square. The quality of materials used shall be the same or surpass those used in the adjacent existing construction."

Article 4.1.1 - Delete in its entirety and add the following: "The Architect-Engineer is the design professional identified in the Owner- Contractor Agreement. Throughout the contract documents, the Architect-Engineer is referred to as if singular in number and masculine in gender. The terms Architect and Architect-Engineer mean the Architect-Engineer or his authorized representative."

Article 4.2.12 - Delete end of last sentence: "and will not be liable for the result of any interpretation or decision rendered in good faith."

Article 5.2.1 - Add the following: "The Contractor shall not remove or replace subcontractors listed in his bid subsequent to the lists being made public at the bid opening, except upon good cause shown and only when approved in writing by the Owner."

Article 7.1 – Delete in its entirety and replace with the following:

Article 7.1.1- During the course of the Contractor's performance of the work necessary to complete the subject Project, certain events may occur which have the effect of changing the conditions under which the work is to be performed as specified and described in the Bidding Documents, and/or the nature and extent of the work as specified and described in the Bidding Documents. The occurrence of such events may cause the Contractor to incur greater or less cost and expense to perform the work required to complete the subject Project than planned to be incurred in the Contractor's successful bid, in which event the Contractor or the Owner shall respectively be entitled to either an increase or decrease in the Contract Sum, whichever is the case, to the extent such greater or less cost and expense results, and in which event the party entitled to the benefit of any such adjustment to the Contract Sum shall, within twenty-one (21) calendar days from the first occurrence of such event(s), present written demand therefore on the other party through the Owner. Should the Contractor and Owner be unable to settle and dispose of such demand within thirty (30) calendar days from the date any such claim is presented, upon terms and conditions mutually agreeable to the Contractor, then such demand shall be referred to the Owner for determination, which determination shall be final and binding upon the Contractor, unless appealed in accordance with applicable provisions of the Contract Documents, and if the Owner, upon considering any such demand, determines that the Contract Sum should be increased or decreased, the Owner's determination of the amount of any such increase or decrease in the Contract Sum shall be governed and controlled by strict adherence to the following described guidelines and limitations, and neither the Contractor or the Owner shall be entitled to receive any monetary consideration beyond that which is authorized herein below.

Article 7.2.2 - All adjustments to the Contract Sum resulting from a change in the work shall be determined by the measure of actual or estimated as the case may be, out-of-pocket costs and expenses incurred or spared by the Contractor for labor, materials, equipment, and equipment rental, plus overhead and profit thereon, for performing the changed work.

1) Labor costs shall be inclusive of all direct job site cost for estimation, laying out, mechanics' wages and laborers' wages, together with all payroll taxes, payroll assessments, and insurance premiums paid for such labor.

2) All material costs, equipment costs and equipment rental costs shall be trade discount rates, plus State Sales Tax, where applicable.

3) Overhead and profit shall be inclusive of all project management, project administration, superintendence, project coordination, project scheduling and other administrative support functions and services, whether performed on the job site or off the job site and general support equipment. Overhead and profit shall be determined as follows:

1. Overhead and profit shall be calculated at the rate of 15% of the Contractor's labor, material, equipment and equipment rental costs, incurred or spared, as measured under the preceding paragraphs for changes in the work performed by the officers, employees or subsidiaries of the Contractor.

SECTION 000800 – SUPPLEMENT TO THE AGREEMENT FOR GENERAL CONTRACTOR’S SERVICES (continued):

2. Overhead and profit shall be calculated at the rate of 7 1/2 percent of the Contractor's sub-contractors' actual labor, material, equipment and equipment rental costs, incurred or spared, as measured under the preceding paragraphs, plus 15% of all such costs, as overhead and profit to the Contractor's subcontractors, for all changes in the work performed by the officers, employees or subsidiaries of the Contractor's sub-contractors.
- 4) In addition to the foregoing, all adjustments to the Contract Sum resulting from a change in the work shall include all out-of-pocket expenses, incurred or spared, in performing the changes in the work for:
 1. Paying the premiums required to obtain Performance Bonds and Labor and Material Payment Bonds called for by the Contract Documents;
 2. Paying the fee(s) required for licenses or permits called for by changes in the work;
 3. Paying for delivery of materials or equipment to the job site;
 4. Paying for storage of materials or equipment before use thereof in performing changes in the work, and
 5. Paying for testing required by the changes in the work.
- 5) In the event Contractor demands an adjustment in the Contract Sum, such demand shall be accompanied by paid receipts or other such written evidence satisfactory to the Owner itemizing the costs and expenses incurred as a result of the event(s) constituting the changes in the work.

Article 8.3.1 – Delete the words “or by delay authorized by Owner pending arbitration.”

Article 8.3.3 - Delete in its entirety and replace with the following:

Article 8.3.3 of the AIA General Conditions is deleted and Contractor's remedies for delays the progress of the Work, or for changes in the Work, shall be limited to those provided in this Article. The contractor's exclusive remedy for delays in performance of the contract caused by events beyond its control shall be a claim for equitable adjustment in the contract time; provided, however, inasmuch as the parties expressly agree that overhead cost incurred by Contractor for delays in performing the Work cannot be determined with any degree of certainty, it is hereby agreed that in the event the Contractor is delayed in the progress of the Work after Notice to Proceed to Mobilize on Site and to Proceed with Construction for causes beyond its control and attributable only to acts or omissions of Owner, Contractor shall be entitled to compensation for overhead cost and profit either (a) as a fixed percentage of the actual cost of the change in the Work, if the delay results from a change in the Work, as calculated in Section C, "Conditions of the Contract", or (b) if the delay results from other than a change in the Work, at an amount for each day of delay calculated by dividing an amount equal to a percentage of the original contract sum determined on the graph enclosed as Exhibit 14 by the number of calendar days of the original contract time.

In the event of a change in the Work, Contractor's claim for adjustments in contract sum are limited exclusively to its actual costs for such changes plus fixed percentages for overhead, additional profit and bond costs, as specified herein.

The forgoing remedies for delays and changes in the Work are to the exclusion of, and thus eliminate, the total cost concept (that is, computing Contractor's additional costs for changes in Work or the costs of a delay in the progress of the Work by comparing Contractor's total actual costs with its original estimate, see McDevitt & Street Company v. Department of Management Services State of Florida, 377 So.2d 191, (Fla. 1st-DCA 1979)) as method of determining Contractor's costs associated with a change in the Work or with delay in the progress of the Work.

No provision of this contract shall be construed as a waiver of sovereign immunity by the Owner.

Article 9 - Delete in its entirety and replace with the following:

SECTION 000800 – SUPPLEMENT TO THE AGREEMENT FOR GENERAL CONTRACTOR’S SERVICES (continued):

The Owner will, at intervals, pay or cause to be paid to the Contractor as follows:

Payments to Contractors

Thirty (30) calendar days shall be allowed for the Owner's inspection and approval of the goods and services for which any Application for Payment is made.

1. Indemnification Rider - In addition to the Contract Sum, the Owner shall pay the Contractor ten dollars (\$10.00) for the indemnification Rider prescribed in Section C-4 hereinabove. Application for Payment of the ten dollars (\$10.00) shall be submitted to the Owner by the Contractor simultaneously with the Contractor's execution and delivery of the Contract to the Owner. Within thirty (30) calendar days from the Owner's receipt of said Application, the Owner shall pay or cause to be paid to the contractor the amount of ten dollars (\$10.00).

2. Progress Payments Against Contract Sum - Based upon Application for Payment submitted to the Architect-Engineer by the Contractor and Certificates of Payment issued by the Architect-Engineer and accepted by the Owner, the Owner shall make progress payments to the Contractor against the account of the Contract Sum in accordance with the following:

(1) Within thirty (30) calendar days from the Owner's receipt and acceptance of a certificate of payment, the Owner shall pay, or cause to be paid to the Contractor, 90% of the portion of the contract sum properly allocable to labor, materials and equipment incorporated into the work, and 90% of that portion of the contract sum properly allocable to materials and equipment suitably stored at the site or at some other locations agreed upon in writing by the parties, less the aggregate of previous payments. However, at the time the work is 50% complete or thereafter, if the manner of completion of the work and its progress are and remain satisfactory to the Architect-Engineer, the Architect-Engineer may authorize a 5% retainage on progress payments. The full 10% retainage may be reinstated if the manner of completion of the work and its progress do not remain satisfactory to the Architect-Engineer or for other good and sufficient reasons.

(a) The Contractor shall promptly pay each Subcontractor in accordance with Section 287.0585, Florida Statutes, upon receipt of payment from the Owner out of the amount paid to the Contractor on account of such Subcontractor's Work, the amount to which said Subcontractor is entitled, reflecting the percentage actually retained, if any, from payments to the Contractor on account of such Subcontractor's work

(b) The Architect-Engineer may, on request at his discretion, furnish to a Subcontractor, if practical, information regarding the percentages of completion of the amount applied for by the Contractor and the action taken thereon by the Architect-Engineer on account of Work done by such Subcontractor

(c) Neither the Owner nor the Architect-Engineer shall have any obligation to pay or to see to the payment of any monies to any Subcontractor except as may otherwise be required by law.

(d) No Certificate for a progress payment, nor any progress payment, nor any partial or entire use of occupancy of the project by the Owner, shall constitute an acceptance of any work not in accordance with the Contract Documents.

1. The Contractor shall request such compensation by submitting:

(1) A properly completed and notarized Application for Progress Payment on the form enclosed as Exhibit 11.

SECTION 000800 – SUPPLEMENT TO THE AGREEMENT FOR GENERAL CONTRACTOR’S SERVICES (continued):

- (2) A properly completed Contractor’s Minority Business Enterprises Status Report of Partial Payment on the form enclosed as Exhibit 18. This form must be submitted even if no minorities were utilized.
- (3) A schedule of Contract Values as described below.

The Contractor shall, within ten (10) calendar days from date of Agreement, submit to the Architect-Engineer for approval three copies of a Schedule of Contract Values which will reflect the estimated cost of each subdivision of work of each specification section, further detailed by Subcontractor item, and utilizing the Construction Specification’s Institute "Masterformat Broadscope Section Numbers". The value of each item shall include a true proportionate amount of the Contractor’s overhead and profit. The sum of all such scheduled values shall equal the Contract Sum as evidenced by the Agreement.

The approved Schedule of Contract Values will accompany and support the Contractor’s periodic Applications for Payment and shall indicate the value of suitably stored material as well as labor performed and materials incorporated into the work for each subdivision of the schedule during the period for which the requisition is prepared.

The Schedule of Contract Values form enclosed as Exhibit 12 will be utilized to present this and other pertinent information which will facilitate the checking and processing by the Owner’s representatives of the Contractor’s Application for Payment.

Article 9.8.2 – Replace in its entirety with the following: “When the Contractor considers that the Work, or a portion thereof which the Owner agrees to accept separately, in substantially complete, the contractor shall prepare and submit to the Agent/Owner a comprehensive list of items to be completed or corrected prior to final payment. The Contractor shall include in this list all items required regulatory inspectors and shall attach a Certificate of Occupancy or Temporary Certificate of Occupancy.”

Article 9.8.3 – Replace in its entirety with the following: “Upon receipt of the Contractor’s list, the Agent/Owner shall make a thorough inspection of the Work within ten (10) working days and add to the Contractor’s list any additional items found to be incomplete. Failure to include an item on this comprehensive punch list does not alter the responsibility of the Contractor to complete all Work in accordance with the Contract Documents. This comprehensive punch list shall be delivered to the Contractor within 5 working days of the inspection. If the Agent/Owner’s inspection discloses any item which is not sufficiently complete for the project to be declared Substantially Complete as defined in Article 9.8.1 above, the Contractor shall complete or correct such item and request another inspection by the Owner/Agent to determine Substantial Completion.

Article 9.8.6 – Insert the following new Article: “After the issuance of the comprehensive punch list and the Certificate of Substantial Completion, the Contractor shall have a minimum of 30 days to complete the Work. If the Agent/Owner has not provided the comprehensive punch list to the Contractor within the time limit specified above, the Contract Time must be extended by the number of days the Agent/Owner exceeded the time limit. Damages may not be assessed against a Contractor for the time period of this time extension.

Article 9.10.2 – Add the following sentences as the first lines of this Article: Upon completion of all items on the comprehensive punch list referred to in Article 9.8.6, the Contractor may submit an Application for Payment for all remaining retainage withheld by the Owner. The Owner may continue to withhold up to 150% of all outstanding or disputed items, including the cost of preparing close out documents listed below.

Article 11 - Delete in its entirety.

Article 13.5.1 - Delete last sentence: "the Owner shall bear cost of tests, inspections or approvals which do not become requirements until after bids are received or negotiation concluded ." and add; "The Architect-Engineer shall designate the tests which shall be made, and the Contractor shall not obligate the Owner for tests without the Architect-Engineer's approval."

SECTION 000800 – SUPPLEMENT TO THE AGREEMENT FOR GENERAL CONTRACTOR’S SERVICES (continued):

Testing Costs Paid For by the Contractor

Certain tests of materials, equipment and systems are required as part of the contract and shall be paid for by the Contractor. These are specifically named in the technical specifications and the types of tests are as follows:

- 1) Where tests are required by the technical specifications for materials, methods or equipment, the Contractor shall pay the cost of initial tests to prove qualities and determine conformance with specification requirements, e.g., mill tests on cement and steel; load testing of piling; sieve analysis and calorimetric tests on sand; strength tests for determining proportions of materials or concrete, moisture content and sound transmission tests of concrete blocks, etc;
- 2) If substitute materials or equipment are proposed by the Contractor, he shall pay the cost of all tests which may be necessary to satisfy the Architect-Engineer that specification requirements are satisfied;
- 3) If materials or workmanship are used which fail to meet specification requirements the Contractor shall pay the costs of all coring or other tests deemed necessary by the Architect-Engineer to determine the safety or suitability of the material or element;
- 4) The Contractor shall pay for all testing costs, including but not limited to; power, fuel, and equipment and systems for proper operation such as plumbing, heating ventilation, air conditioning, electrical, elevator, dumbwaiters and conveyors, etc.

Testing Costs Borne by the Owner

All other tests performed at the direction of the Architect-Engineer or the Owner shall be paid for by the Owner, except to the extent that the costs of performing such tests are otherwise chargeable to the Contractor under provisions of the Contract Documents.

Article 13.6 - Delete in its entirety.

Article 13.7 - Delete in its entirety.

Article 15 – Delete in its entirety and replace with the following:

Claims and Disputes

A Claim is a demand or assertion by one of the parties seeking, as a matter of right, adjustment or interpretation of Contract terms, payment of money, extension of time or other relief with respect to the terms of the Contract. The term "Claim" also includes other disputes and matters in question between the Owner and Contractor arising out of or relating to the Contract. Claims must be made by written notice. The responsibility to substantiate Claims shall rest with the party making the claim.

No provision of the Contract Documents makes or is intended to make provision for recovery by Contractor of damages for delay or for breach of contract. All claims, disputes or controversies under this contract shall be determined and settled as provided in Section C-41 hereinafter. No claim for breach of contract shall be submitted, determined or settled under Section C-41 hereinafter.

Time Limits on Claims

Claims by either party must be made within 21 days after occurrence of the event giving rise to such Claim or within 21 days after the claimant first recognizes the condition giving rise to the Claim, whichever is later. Claims must be made by written notice. An additional Claim made after the initial Claim has been implemented by Change Order will not be considered unless submitted in a timely manner.

Continuing Contract Performance

Pending final resolution of a Claim unless otherwise agreed in writing the Contractor shall proceed diligently with performance of the Contract and the Owner shall continue to make payments in accordance with the Contract Documents.

SECTION 000800 – SUPPLEMENT TO THE AGREEMENT FOR GENERAL CONTRACTOR'S SERVICES (continued):

The provisions of Chapter 28-106, Florida Administrative Code to the extent not inconsistent with this Article are referred-to and adopted by reference and shall govern procedures for claims.

Under the terms of this Agreement, the Contractor shall not have any right to compensation other than, or in addition to, that provided by this Agreement, to satisfy any claim for costs, liabilities or debts of any kind whatever resulting from any act or omission attributable to the Owner unless the Contractor has provided notice as required by Section C-36 and unless the claim therefore is delivered to the Owner. All such claims shall be set forth in a petition stating:

1. Name and business address of the claimant,
2. A concise statement of the ultimate facts, including the statement of all disputed issues of material fact, upon which the claim is based.
3. A concise statement of the provisions of the contract together with any federal, state and local laws, ordinances or code requirements or customary practices and usage's in the industry asserted to be applicable to the questions presented by the claim and a demand for the specific relief believed to be due the claimant, and
4. The date of the occurrence of the event giving rise to the claim and the date and manner of Contractor's compliance with the notice requirements of Section C-36.

Within thirty (30) calendar days from the date any such claim is received, the Owner shall deliver to the Contractor its written determination on the claim. Unless the Owner's determination is agreed to by the Contractor and a consent order adopting the determination is entered within thirty (30) days of receipt of the Owner's determination, the Owner shall designate a hearing officer who shall conduct a proceeding in accordance with Chapter 28-106, F.A.C.

The Contractor shall carry on the Work and maintain the progress schedule during any administrative proceeding unless otherwise agreed by the Contractor and the Owner in writing.

The venue for all civil and administrative actions against the department shall be in Leon County, unless otherwise agreed by the parties.

C EXCLUSION OF OWNER FROM LIABILITY

Notwithstanding any other provision of the Contract Documents, should the Contractor sustain loss or be damaged by act or omission of a separate Contractor, the Owner shall not be liable for any such loss or damage and the Contractor shall not be entitled to obtain any monetary relief from the Owner to compensate for any such loss or damage, but shall be limited to such recovery as is otherwise available at law from persons and/or entities other than the Owner.

D PROHIBITED MATERIALS - ASBESTOS

Per Section 255.40, Florida Statutes, the use of asbestos or asbestos-based fiber materials is prohibited in any buildings, construction of which is commenced after September 30, 1983, which is financed with public funds or is constructed for the express purpose of being leased to any government entity.

E INTEREST PROVISIONS

Any monies not paid when due to either party under this Agreement shall not bear interest except as may be required by Section 215.422(3)(b), Florida Statutes.

F HARMONY

Contractor is advised and hereby agrees that he will exert every reasonable and diligent effort assure that all labor employed by Contractor and his Subcontractors for Work on the project shall work in harmony with and be compatible with all other labor being used by building and construction contractors now or hereafter on the site of the project.

Contractor further agrees that this provision will be included in all subcontracts of the Subcontractor as well as in the Contractor's own contract; provided, however, that this

SECTION 000800 – SUPPLEMENT TO THE AGREEMENT FOR GENERAL CONTRACTOR’S SERVICES (continued):

provision shall not be interpreted or enforced so as to deny or abridge, on account of membership or non-membership in any labor union or labor organization, the right of any person to work as guaranteed by Article I, Section 6 of the Florida Constitution.

H TERMINATION FOR CAUSE OR MUTUAL AGREEMENT

This Agreement may be terminated by either party upon seven (7) days' notice by mutual agreement, or should one party fail substantially to perform in accordance with its terms through no fault of the other. Also, this Agreement may be unilaterally terminated by the Owner for refusal by the Contractor to allow public access to all documents, papers, letters, or other material subject to the provisions of Chapter 119, Florida Statutes, and made or received by the Contractor in conjunction with this Agreement. In the event of termination, due to the fault of others than the Contractor, the Contractor shall be paid for services performed to termination date, including reimbursements then due plus terminal expense.

I TERMINATION FOR CONVENIENCE

The performance of work under this contract may be terminated by the Owner in accordance with this clause in whole, or from time to time in part, whenever the Owner shall determine that such termination is in the best interest of the Owner. Upon termination, the contractor shall be entitled to payment and profit for Work completed to the time of termination, only. The percentage of completion shall be determined by the Architect/Engineer, based upon the approved Schedule of Values.

J CONTRACTOR PAYMENT RIGHTS

Contractors providing goods and services to the Owner should be aware of the following time frames. Upon receipt, the Owner has thirty (30) days to inspect and approve the goods and services. (see Article 6 herein above). The Owner has twenty (20) days to deliver a request for payment (voucher) to the Department of Banking and Finance. The 20 days are measured from the latter of the date the Pay Request is received or the goods or services are received, inspected and approved.

If payment is not available to the Owner for transmittal to the Contractor within 40 days, a separate interest penalty of .03333 percent per day will be due and payable, in addition to the Pay Request amount, to the vendor. The 40 days are also measured from the latter of the date the invoice is received or the goods or services are received, inspected and approved. Interest penalties of less than one (1) dollar will not be enforced unless the Contractor requests payment. Pay Requests which have to be returned to a Contractor because of Contractor preparation errors will result in a delay in the payment. The Pay Requests payment requirements do not start until a properly completed Pay Request is provided to the Owner.

A Vendor Ombudsman has been established within the Department of Banking and Finance. The duties of this individual include acting as an advocate for vendors who may be experiencing problems in obtaining timely payment(s) from a state agency. The Vendor Ombudsman may be contacted at 850) 410-9354 or by calling the State Comptroller's Hotline, 1-800-848-3792.

K WATER

Water necessary for construction of the building and testing its plumbing and mechanical systems shall be furnished by the Contractor. He shall make all connections, install a meter, take out and pay for all permits necessary, do all piping and clear away all evidence of same after the job is completed.

L ELECTRICITY

All electricity for light and power necessary for the construction of the building and testing of its electrical and mechanical systems shall be paid for by the Contractor. He shall make all necessary arrangements for this service and perform the work required.

M INITIAL CONSTRUCTION CONFERENCE

Immediately prior to starting construction or as soon as possible after the construction has started, the Owner's Project Director will arrange a meeting with the Design Professional, State

SECTION 000800 – SUPPLEMENT TO THE AGREEMENT FOR GENERAL CONTRACTOR'S SERVICES (continued):

Agency that will occupy the project, General Contractor, Federal Representatives if involved, Bureau of Apprenticeship and other interested parties. The purpose of this meeting shall be to discuss requirements and responsibilities of the various parties involved with the objective of expeditious handling of the construction contract. The Owner's Project Director will chair this meeting.

N SITE SECURITY

The Contractor shall pay for and be responsible to secure the site and the project against theft, vandalism, fire and public safety at all times (24 hours per day) from Notice to Proceed until Substantial Completion.

End of Supplement to the Agreement

SECTION 011000 - SUMMARY OF WORK

PART 1 - GENERAL

1.01 RELATED DOCUMENTS: Drawings and general provisions of Contract, including General and Supplementary Conditions and other Division-1 Specification Sections, apply to this Section.

1.02 PROJECT DESCRIPTION

A. The Project shall consist of selective demolition and remodeling as indicated on drawings for the Leon County Medical Examiner Office.

1. Project Location: 525 Appleyard Drive, Tallahassee, Florida
2. Owner: Leon County

B. Contract Documents, dated February 27, 2017 (Bid Documents) were prepared for the Project by Clemons Rutherford and Associates, 2027 Thomasville Road, Tallahassee, Florida.

C. The work consists of:

1. Demolition of interior walls, partitions, casework and finishes.
2. Demolition of existing exterior and interior doors.
3. New mechanical, electrical and plumbing systems.
4. New interior partitions, millwork, casework and finishes.
5. New exterior doors and windows.
6. Clean existing exterior masonry walls and seal/paint.
7. New main entrance and sidewalks.
8. New autopsy laboratory equipment.
9. Coordination of delivery and installation of new and existing Owner furnished equipment.
10. Contractor is responsible for scheduling COT inspections.
11. New canopies.
12. New exterior and interior walls.
13. New metal roof and fascia; repair existing.

D. Work Sequence: The work will be conducted in such a sequence to minimize interference to Owner's normal activities surrounding the facility. The building will be unoccupied.

E. Applicable Codes: All work shall be completed in accordance with the following codes where applicable:

- | | |
|--|-----------------------|
| 1. Florida Building Code, Building (FBC, B) | Fifth (2014) Edition. |
| 2. Florida Building Code, Existing Building (FBC-EB) | Fifth (2014) Edition. |
| 3. Florida Building Code, Mechanical (FBC, M) | Fifth (2014) Edition. |
| 4. Florida Building Code, Fuel Gas (FBC, FG) | Fifth (2014) Edition. |
| 5. Florida Building Code, Plumbing (FBC, P) | Fifth (2014) Edition. |
| 6. Florida Building Code, Accessibility (FACBC) | Fifth (2014) Edition. |
| 7. Florida Fire Prevention Code (FFPC) | Fifth Edition. |
| 8. NFPA 101 Life Safety Code | 2012 Edition. |
| 9. National Electric Code (NEC) | 2008 Edition. |

F. Product Approval Contractor shall be responsible for providing Florida Product Approval Numbers OR certify that products installed conform to the Florida Building Code 2004 Edition, for each product installed in the building envelope.

SECTION 011000 - SUMMARY OF WORK (continued):

- G. Construction Manager: Construction Manager has been engaged for this project to serve as Contractor who in turn Subcontracts all or portions of the work. In Divisions 1 through 16, the terms "Construction Manager" and "Contractor" are synonymous.

1.03 CONTRACTOR USE OF PREMISES

- A. General: During the construction period, the contractor shall have limited use of the premises for construction activities in areas indicated or agreed upon by the Owner. Existing buildings shall remain operational and be occupied throughout the duration of construction.

1. Confine operations to areas within Contract limits indicated. Portions of the site beyond areas in which construction operations are indicated are not to be disturbed.
2. Keep surrounding driveways, sidewalks, and entrances serving the premises clear and available to the Owner and Visitors at all times. Do not use these areas for parking or storage of materials. Schedule deliveries to minimize space and time requirements for storage of materials and equipment on site.

- B. Construction Safeguards: The contractor shall construct safeguards to protect personnel and visitors from the construction areas and areas where materials are stored. Limits of the construction safeguards shall be determined by the Owner.

Note: Construction area, including building and buildings being renovated, shall remain accessible to handicap during entire construction process. Contractor is responsible for providing temporary access to building where needed. This includes temporary ramps, walkways, handrails and all other necessary items required. Contractor shall be responsible for inspecting construction site to determine the extent of temporary access needed. (These items are not necessarily shown on drawings). Contractor shall comply with all ADA requirements.

- C. Facilities, or portions of facilities, shall not be occupied during construction unless exits, fire detection and early warning systems, fire protection, and safety barriers are continuously maintained and clearly marked at all times.

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

PART 2 - PRODUCTS (Not applicable).

PART 3 - EXECUTION

- 3.01 LAYOUT OF THE WORK: Dimensions and elevations indicated on the drawings shall be verified by the Contractor prior to commencement of work. Discrepancies between drawings, specifications, and existing conditions shall be referred to the Architect for adjustment before affected work is performed. Failure to make such notification shall place responsibility upon the Contractor to carry out the work in a satisfactory and workmanlike manner at no additional cost to the Owner.

3.02 RESTORATION

SECTION 011000 - SUMMARY OF WORK (continued):

- A. Remove, cut, alter, replace, patch and repair existing work as necessary to install new work. Except as otherwise shown or specified, do not cut, alter or remove any structural work and do not disturb any ducts, plumbing, steam, gas or electric work without approval. All existing walls to remain shall be patched/repared to match adjacent surfaces.
- B. Existing work (walls, ceilings, partitions, floors, mechanical and electrical work, lawns, paving, roads, walks, etc.) disturbed or removed as a result of performing required new work, shall be patched, repaired, reinstalled, or replaced with new work, and refinished and left in as good condition as existed before commencing work. Existing work to be altered or extended and that is found to be defective in any way, shall be reported to Architect before it is disturbed. Materials and workmanship used in restoring work, shall conform in type and quality to that of original existing construction, except as otherwise shown or specified.
- C. Upon completion of contract, deliver work complete and undamaged. Damage that may be caused by Contractor or his workmen to existing structures, grounds, and utilities or work done by others shall be repaired by him at no additional cost to the Owner and left in as good condition as existed prior to damaging.
- D. At his own expense, Contractor shall immediately restore to service and repair any damage he may cause to existing piping and conduits, wires, cables, etc., of utility services or of fire protection systems and communications systems which are not scheduled for discontinuance or abandonment. Contractor shall employ appropriate parties for repair work.

3.03 CLEANING UP

- A. At completion of the work, the Contractor shall remove from the building and site all tools, appliances, surplus materials, debris, temporary structures and facilities, scaffolding, and equipment; sweep clean the building thoroughly and remove all marks, stains, fingerprints, dust, dirt, paint drippings, and the like from all surfaces; clean tile work, windows, plumbing, and other fixtures and surfaces.
- B. All hardware and other unpainted metals shall be cleaned and polished, and all equipment and paint or decorated work shall be cleaned and touched up, if necessary. Surfaces that are waxed shall be polished. Remove all temporary labels, tags, and paper covering throughout the building.
- C. The exterior of the buildings, the grounds, approaches, equipment, pavement, sidewalks, etc., shall be cleaned similar to interior of buildings and left in good order at the time of final acceptance, with paint surfaces clean and unbroken, hardware clean and polished, all repair work accomplished and dirt areas scraped and cleared of weed growth.
- D. Cleaning, polishing, sealing, waxing, and all other finish operations indicated on the drawings, or required in the specifications, shall mean that this is the required condition at the time of acceptance of all work under the contract.

END OF SECTION 011000

SECTION 012300 - ALTERNATES

PART 1 - GENERAL

- 1.01 AN ALTERNATE is a separate piece of work proposed by Bidders and stated on the Bid Form for certain items that may be added to or deducted from Base Bid amount, which the Owner may or may not decide to accept, a corresponding change in either the amount of construction to be completed, or in the products, materials, equipment, systems or installation methods described in Contract Documents.

The Owner shall have the right to accept Alternates in any order and to determine the low Bidder on the basis of the sum of the Base Bid and Alternates accepted.

- 1.02 COORDINATION: Contractor shall coordinate related Work and modify or adjust adjacent Work as necessary to ensure that Work affected by each accepted alternate is complete and fully integrated into the Project.
- 1.03 NOTIFICATION: Immediately following Contract award, the Architect shall prepare and distribute to each party involved, notification of the status of each alternate. Indicate whether alternates have been accepted, rejected or deferred for consideration at a later date. Include a complete description of negotiated modifications to alternates.
- 1.04 SCHEDULE: A "Schedule of Alternates" is included below. Specification Sections referenced in the Schedule contain requirements for materials and methods necessary to achieve the Work described under each alternate.

Include as part of each alternate, miscellaneous devices, accessory objects and similar items incidental to or required for a complete installation whether or not mentioned as part of the alternate.

1.05 SCHEDULE OF ALTERNATES

- A. Complete and finish Room 124 (Decontamination).
- B. Complete and finish Room 102 (Assistant Medical Examiner) and Room 103 (Pathologist's Office).
- C. Ceiling Hung Body Lift (located in Receiving Bay).
- D. Floor to Ceiling Security Fencing with a Lockable Gate (at Main Cooler).
- E. Fluid Applied Restoration (Section 075630).
- F. Evidence Drying Cabinet (located in Evidence Storage Room).
- G. Resinous Flooring – Alternate (Section 096710).

END OF SECTION 012300

SECTION 012500 – SUBSTITUTION PROCEDURES

PART 1 - GENERAL

- 1.01 **SUBSTITUTIONS:** Requests for changes in products, materials, equipment, and methods of construction required by Contract Documents proposed by the Contractor after award of the Contract are considered requests for "substitutions." The following **are not** considered substitutions:
- A. Substitutions requested during the bidding period, and accepted prior to award of Contract.
 - B. Revisions to Contract Documents requested by the Owner or Architect.
 - C. Specified options of products and construction methods included in Contract Documents.
 - D. Compliance with governing regulations and orders issued by governing authorities.
- 1.02 **SUBMITTAL:** Requests for substitution will be considered if received within 30 days after commencement of the Work. Requests received may be considered or rejected at the discretion of the Architect after review. See mechanical and electrical "General Provisions" section for special substitution requirements.
- A. Submit 3 copies of each request for substitution in the form and in accordance with procedures for Change Order proposals.
 - B. Identify the product, or installation method to be replaced in each request. Include related Specification Section and Drawing numbers. Document compliance with requirements for substitutions, and the following information, as appropriate:
 - 1. Product Data, including Drawings and descriptions of products, fabrication and installation procedures.
 - 2. Samples, where applicable or requested.
 - 3. A comparison of significant qualities of the proposed substitution with those specified.
 - 4. A list of changes or modifications needed to other parts of the Work and to construction performed by the Owner and separate Contractors, that will be necessary to accommodate the proposed substitution.
 - 5. A statement indicating the substitution's effect on the Construction Schedule compared to the Schedule without approval of the substitution. Indicate the effect of the proposed substitution on overall Contract Time.
 - 6. Cost information, including a proposal of the net change, if any in the Contract Sum.
 - 7. Certification that the substitution is equal-to or better in every respect to that required by Contract Documents, and that it will perform adequately in application indicated. Include Contractor's waiver of rights to additional payment or time, that may be necessary because of the substitution's failure to perform adequately.
 - C. **Architect's Action:** Within one week of receipt of the request for substitution, the Architect will request additional information necessary for evaluation. Within 2 weeks of receipt of the request, or one week of receipt of additional information, whichever is later, the Architect will notify the Contractor of acceptance or rejection. If a decision on use of a substitute cannot be made within the time allocated, use the product specified. Acceptance will be in the form of a Change Order,

SECTION 012500 – SUBSTITUTION PROCEDURES (continued):

- 1.03 **SUBSTITUTIONS:** The Contractor's substitution request will be received and considered by the Architect when one or more of the following conditions are satisfied, as determined by the Architect; otherwise requests will be returned without action except to record noncompliance with these requirements.
- A. The request is directly related to an "or approved equal" clause or similar language in the Contract Documents.
 - B. The specified product or method of construction cannot be provided within the Contract Time. The request will not be considered if the product or method cannot be provided as a result of failure to pursue the Work promptly or coordinate activities properly.
 - C. The specified product or method of construction cannot receive necessary approval by a governing authority, and the requested substitution can be approved.
 - D. A substantial advantage is offered the Owner, in terms of cost, time, energy conservation or other considerations of merit, after deducting offsetting responsibilities the Owner may be required to bear. Additional responsibilities for the Owner may include additional compensation to the Architect for redesign and evaluation services, increased cost of other construction by the Owner or separate contractors, and similar considerations.
 - E. The specified product or method of construction cannot be provided in a manner that is compatible with other materials, and where the Contractor certifies that the substitution will overcome the incompatibility.
 - F. The specified product or method of construction cannot be coordinated with other materials, and where the Contractor certifies that the proposed substitution can be coordinated.
 - G. The specified product or method of construction cannot provide a warranty required by the Contract Documents and where the Contractor certifies that the proposed substitution provide the required warranty.
- 1.04 The Contractor's submittal and Architect's acceptance of Shop Drawings, Product Data or Samples that relate to construction activities not complying with the Contract Documents does not constitute an acceptable or valid request for substitution, nor does it constitute approval.

END OF SECTION 012500

SECTION 013100 - PROJECT COORDINATION

PART 1 - GENERAL

1.01 **THIS SECTION** specifies requirements for project coordination including:

Coordination with other Contractors. Administrative and supervisory personnel.	General installation provisions. Cleaning and protection.
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1.02 **COORDINATION**: Coordinate activities included in various Sections to assure efficient and orderly installation of each component. Coordinate operations included under different Sections that are dependent on each other for proper installation and operation.

Where installation of one component depends on installation of other components before or after its own installation, schedule activities in the sequence required to obtain the best results.

Where space is limited, coordinate installation of different components to assure maximum accessibility for maintenance, service and repair.

Make provisions to accommodate items scheduled for later installation.

Prepare memoranda for distribution to each party involved outlining required coordination procedures. Include required notices, reports, and attendance at meetings.

Prepare similar memoranda for the Owner and separate Contractors where coordination of their Work is required.

1.03 **ADMINISTRATIVE PROCEDURES**: Coordinate scheduling and timing of administrative procedures with other activities to avoid conflicts and ensure orderly progress. Such activities include:

Preparation of schedules.	Delivery and processing of submittals.
Power and utility shutdowns.	Progress meetings.
Installation and removal of temporary facilities.	Project closeout activities.

1.04 **COORDINATION DRAWINGS**: Prepare Coordination Drawings where close coordination is required for installation of products and materials fabricated off-site by separate entities, and where limited space necessitates maximum utilization of space for efficient installation of different components.

Show relationship of components shown on separate Shop Drawings.
Indicate required installation sequences.

1.05 **STAFF NAMES**: Within 15 days of Notice to Proceed, submit a list of Contractor's staff assignments, including Superintendent and personnel at the site; identify individuals, their duties and responsibilities, addresses and telephone numbers.

Post copies in the Project meeting room, the field office, and at each temporary telephone.

1.06 **INSPECTION OF CONDITIONS**: The Installer of each component shall inspect the substrate and all other conditions under which Work is to be performed. Do not proceed until unsatisfactory conditions have been corrected.

1.07 **MANUFACTURER'S INSTRUCTIONS**: Comply with manufacturer's installation instructions and recommendations, to the extent that they are more stringent than requirements in Contract Documents.

1.08 **INSPECT** material immediately upon delivery and again prior to installation. Reject damaged and defective items.

SECTION 013100 - PROJECT COORDINATION (continued):

- 1.09 PROVIDE ATTACHMENT and connection devices and methods necessary for securing each construction element. Secure each construction element true to line and level. Allow for expansion and building movement.
- 1.10 VISUAL EFFECTS: Provide uniform joint widths in exposed Work. Arrange joints to obtain the best effect. Refer questionable choices to the Architect for decision.
- 1.11 RECHECK MEASUREMENTS and dimensions, including elevations, before starting installation.
- 1.12 INSTALL EACH COMPONENT during weather conditions and project status that will ensure the best results. Isolate each part from incompatible material as necessary to prevent deterioration.
- 1.13 COORDINATE TEMPORARY ENCLOSURES with inspections and tests, to minimize uncovering completed construction for that purpose.
- 1.14 MOUNTING HEIGHTS: Where mounting heights are not indicated, install components at standard heights for the application indicated or refer to the Architect.
- 1.15 CLEANING AND PROTECTION: During handling and installation, clean and protect construction in progress and adjoining materials in place. Apply protective covering where required to ensure protection from damage or deterioration at Substantial Completion.

Clean and maintain completed construction as often as necessary through the construction period. Adjust and lubricate operable components to ensure operability without damaging effects.

Limiting Exposures: Supervise operations to ensure that no part of construction, completed or in progress, is subject to harmful or deleterious exposure. Such exposures include, but are not limited to the following:

- Excessive static or dynamic loading.
- Excessive internal or external pressures.
- Excessive weathering.
- Excessively high or low temperatures or humidity.
- Air contamination or pollution.
- Water or ice.
- Chemicals or solvents.
- Heavy traffic, soiling, staining and corrosion.
- Rodent and insect infestation.
- Unusual wear or other misuse.
- Contact between incompatible materials.
- Theft or vandalism.

END OF SECTION 013100

SECTION 013150 - CUTTING AND PATCHING

PART 1 - GENERAL

1.01 RELATED DOCUMENTS: Drawings and general provisions of Contract, including General and Supplementary Conditions and other Division-1 Specification Sections, apply to this Section.

1.02 SUMMARY: This Section specifies administrative and procedural requirements for cutting and patching.

Refer to other Sections for specific requirements and limitations applicable to cutting and patching individual parts of the work.

Refer to Division-15 and Division-16 Sections for other requirements and limitations applicable to cutting and patching mechanical and electrical installations.

1.03 SUBMITTALS

A. Cutting and Patching Proposal: Where approval of procedures for cutting and patching is required before proceeding, submit a proposal describing procedures well in advance of the time cutting and patching will be performed and request approval to proceed. Include the following information, as applicable, in the proposal:

Describe the extent of cutting and patching required and how it is to be performed; indicate why it cannot be avoided.

Describe anticipated results in terms of changes to existing construction; include changes to structural elements and operating components as well as changes in the building's appearance and other significant visual elements.

List products to be used and firms or entities that will perform Work.

Indicate dates when cutting and patching is to be performed.

List utilities that will be disturbed or affected, including those that will be relocated and those that will be temporarily out-of-service. Indicate how long service will be disrupted.

1.04 QUALITY ASSURANCE

A. Requirements for Structural Work: Do not cut and patch structural elements in a manner that would reduce their load-carrying capacity or load-deflection ratio.

B. Operational and Safety Limitations: Do not cut and patch operating elements or safety related components in a manner that would result in reducing their capacity to perform as intended, or result in increased maintenance, or decreased operational life or safety.

1.05 VISUAL REQUIREMENTS: Do not cut and patch construction exposed on the exterior or in occupied spaces, in a manner that would, in the Architect's opinion, reduce the building's aesthetic qualities, or result in visual evidence of cutting and patching. Remove and replace Work cut and patched in a visually unsatisfactory manner.

PART 2 - PRODUCTS

2.01 MATERIALS: Use materials that are identical to existing materials. If identical materials are not available or cannot be used where exposed surfaces are involved, use materials that match existing adjacent surfaces to the fullest extent possible with regard to visual effect. Use materials whose installed performance will equal or surpass that of existing materials.

SECTION 013150 - CUTTING AND PATCHING (continued):

PART 3 - EXECUTION

3.01 **INSPECTION:** Before cutting existing surfaces, examine surfaces to be cut and patched and conditions under which cutting and patching is to be performed. Take corrective action before proceeding, if unsafe or unsatisfactory conditions are encountered.

3.02 **PREPARATION**

A. **Temporary Support:** Provide temporary support of Work to be cut.

B. **Protection:** Protect existing construction during cutting and patching to prevent damage. Provide protection from adverse weather conditions for portions of the Project that might be exposed during cutting and patching operations.

Avoid interference with use of adjoining areas or interruption of free passage to adjoining areas. Take all precautions necessary to avoid cutting existing pipe, conduit or ductwork serving the building, but scheduled to be removed or relocated until provisions have been made to bypass them.

3.03 **PERFORMANCE**

A. **General:** Employ skilled workmen to perform cutting and patching. Proceed with cutting and patching at the earliest feasible time and complete without delay.

Cut existing construction to provide for installation of other components or performance of other construction activities and the subsequent fitting and patching required to restore surfaces to their original condition.

B. **Cutting:** Cut existing construction using methods least likely to damage elements to be retained or adjoining construction. Where possible review proposed procedures with the original installer; comply with the original installer's recommendations.

In general, where cutting is required, use hand or small power tools designed for sawing or grinding, not hammering and chopping. Cut holes and slots neatly to size required with minimum disturbance of adjacent surfaces. Temporarily cover openings when not in use.

To avoid marring existing finished surfaces, cut or drill from the exposed or finished side into concealed surfaces. Cut through concrete and masonry using a cutting machine such as a carborundum saw or diamond core drill.

Comply with requirements of applicable Sections of Division-2 where cutting and patching requires excavating and backfilling. By-pass utility services such as pipe or conduit, before cutting, where services are shown or required to be removed, relocated or abandoned. Cut-off pipe or conduit in walls or partitions to be removed. Cap, valve or plug and seal the remaining portion of pipe or conduit to prevent entrance of moisture or other foreign matter after by-passing and cutting.

3.04 **PATCHING:** Patch with durable seams that are as invisible as possible. Comply with specified tolerances.

Where feasible, inspect and test patched areas to demonstrate integrity of the installation.

Restore exposed finishes of patched areas and extend finish restoration into retained adjoining construction in a manner that will eliminate evidence of patching and refinishing.

SECTION 013150 - CUTTING AND PATCHING (continued):

Where patching occurs in a smooth painted surface, extend final paint coat over entire unbroken area containing the patch, after the patched area has received primer and second coat.

- 3.05 CLEANING: Thoroughly clean areas and spaces where cutting and patching is performed or used as access. Remove completely from non-intended locations any paint, mortar, oils, putty and items of similar nature. Thoroughly clean piping, conduit and similar features before painting or other finishing is applied. Restore damaged pipe covering to its original condition.

END OF SECTION 013150

SECTION 013200 - PROJECT MEETINGS

PART 1 - GENERAL

1.01 **SUMMARY:** This Section specifies requirements for Project meetings including:

Pre-Construction Conference.
Progress Meetings.

1.02 **PRE-CONSTRUCTION CONFERENCE:** Architect shall conduct a pre-construction conference after execution of the Agreement and prior to commencement of construction activities. Review responsibilities and personnel assignments.

Attendees: The Owner, Architect and their consultants, the Contractor and its superintendent, subcontractors, suppliers, manufacturers, and other concerned parties shall be represented by persons authorized to conclude matters relating to the Work.

Agenda: Discuss significant items that could affect progress, including the tentative construction schedule, critical sequencing, use of the premises, procedures for processing Change Orders and equipment deliveries.

Review progress of other activities and preparations for the activity under consideration at each conference, including time schedules, manufacturer's recommendations, weather limitations, substrate acceptability, compatibility problems and inspection and testing requirements.

Record significant discussions, agreements and disagreements of each conference, along with the approved schedule. Distribute the meeting record to everyone concerned, promptly, including the Owner and Architect.

Do not proceed if the conference cannot be successfully concluded. Initiate necessary actions to resolve impediments and reconvene the conference at the earliest feasible date.

1.03 **PROGRESS MEETINGS:** Conduct progress meetings at regular monthly intervals. Notify the Owner and Architect of scheduled dates. Coordinate meeting dates with preparation of the payment request.

Attendees: The Owner and Architect, each subcontractor, supplier or other entity concerned with progress or involved in planning, coordination or performance of future activities shall be represented by persons familiar with the Project and authorized to conclude matters relating to progress.

Agenda: Review minutes of the previous progress meeting. review significant items that could affect progress. Include topics appropriate to the current status of the Project including:

RFIs	Change Orders
Scheduling	Submittals

Reporting: Distribute copies of the minutes of the meeting to each party present and to parties who should have been present.

1.04 **CONTRACTOR'S CONSTRUCTION SCHEDULE:** Review progress since the last meeting. Determine where each activity is in relation to the Contractor's Construction Schedule, whether on time or ahead or behind schedule. Determine how construction behind schedule will be expedited; secure commitments from parties involved to do so. Discuss whether revisions are required to ensure that current and subsequent activities will be completed within the Contract Time.

SECTION 013200 - PROJECT MEETINGS (continued):

Review the present and future needs of each entity present, including such items as:

- Time.
- Sequences.
- Deliveries.
- Off-site fabrication problems.
- Site utilization.
- Temporary facilities and services.
- Hazards and risks.
- Quality and Work standards.
- Change Orders.
- Documentation of information for payment requests.

END OF SECTION 013200

SECTION 013300 - SUBMITTALS

PART 1 - GENERAL

1.01 GENERAL PROCEDURES

- A. Coordinate submittal preparation with performance of construction activities, and with purchasing or fabrication, delivery, other submittals and related activities. Transmit in advance of performance of related activities to avoid delay.
- B. Coordinate transmittal of different submittals for related elements so processing will not be delayed by the need to review concurrently for coordination. The Architect reserves the right to withhold action on a submittal requiring coordination until related submittals are received.

- 1.02 PROCESSING: Allow two weeks for initial review. Allow more time if processing must be delayed for coordination with other submittals. The Architect will notify the Contractor when a submittal must be delayed for coordination. Allow two weeks for reprocessing each submittal.

No extension of time will be authorized because of failure to transmit submittals sufficiently in advance of the Work to permit processing.

- 1.03 SUBMITTAL PREPARATION: Place a label or title block on each submittal for identification. Provide two 4" x 5" spaces on the label or beside the title block on Shop Drawings to record Contractor's review and approval markings and action taken. Include the following information on the label for processing and recording action taken. Submittals received without a signed Contractor's Approval Stamp will be returned for resubmittal with no action taken.

- Project name.
- Date.
- Name and address of Contractor.
- Name and address of supplier.
- Name of manufacturer.
- Number and title of appropriate Specification Section.
- Drawing sheet number and detail references, as required.

- 1.04 SUBMITTAL TRANSMITTAL: Package submittals appropriately for transmittal and handling. Transmit with a transmittal form. Submittals received from other than the Contractor will be returned without action.

Transmittal Form: Use AIA Document G 810 or other form acceptable to Architect. On the form record requests for data, and deviations from Contract Documents. Include Contractor's certification that information complies with Contract Documents.

- 1.05 CONTRACTOR'S CONSTRUCTION SCHEDULE: Submit a fully developed, CPM type construction schedule, within 30 days after the date of the Owner's issuance of a Notice to Proceed. Use the categories of work in the schedule to establish the categories in the "Schedule of Values".

As work progresses, mark the schedule to indicate Actual Completion.

Provide notations on the Schedule depicting the consequences on the Work from construction phasing.

Prepare the schedule on sheets of sufficient width to show data for the entire construction period.

Secure commitments for performing critical construction operations from parties involved. Coordinate each activity with other activities and show in proper sequence; include minor elements involved in the construction sequence. Indicate sequences necessary for completion of related portions.

Coordinate the Construction Schedule with the Schedule of Values, list of subcontracts, Submittal Schedule, progress reports, payment requests and other schedules.

SECTION 013300 - SUBMITTALS (continued):

Schedule completion in advance of the date established for Substantial Completion. Schedule Substantial Completion to allow time for the Architect's procedures necessary for certification of Substantial Completion.

Print and distribute schedule following initial approval to the Architect, Owner, subcontractors and other parties required to comply with scheduled dates. Redistribute after any approved revisions. Post copies in the temporary field office. Submit update schedule with each Pay Application.

- 1.06 **DAILY CONSTRUCTION REPORTS:** Prepare a daily construction report, recording information concerning events at the site. Submit duplicate copies to the Architect at weekly intervals. Include the following information:

- List of subcontractors at the site.
- Work Activities.
- High and low temperatures, general weather conditions.
- Accidents, stoppages, delays, shortages, losses.
- Emergency procedures.
- Change Orders received, implemented.
- Partial Completions, occupancies.
- Substantial Completions authorized.
- Other relevant dates.

- 1.07 **SUBMITTALS:** Except for Samples illustrating assembly details, workmanship, fabrication techniques, connections, operation and similar characteristics, submit 4 sets plus the number of sets required by the Contractor; maximum eight (8) sets. The Architect will retain four sets and return the others marked with the action taken. (**Note: Architect will mark only one (1) set for return to the Contractor with action taken and/or modifications required.**) Maintain Sample sets at the Project site, for quality comparisons throughout construction phase.

Unless noncompliance with Contract Document provisions is observed, the submittal may serve as the final submittal.

- 1.08 **ARCHITECT'S ACTION:** Except for submittals for record, information or similar purposes, where action and return is required, the Architect will review each submittal, mark to indicate action taken, and return. Compliance with specified characteristics is the Contractor's responsibility.

Action Stamp: The Architect will stamp each submittal with a self-explanatory action stamp. The stamp will be appropriately marked to indicate action taken.

- 1.09 **DISTRIBUTION:** Furnish copies of final submittal to installers, and others required for performance of construction activities. Show distribution on transmittal forms. Do not proceed with installation until an applicable copy of Product Data is in the installer's possession. Do not permit use of unmarked copies of Product Data in connection with construction.

- 1.10 **SHOP DRAWINGS:** Submit information, drawn to accurate scale. Submittals shall **indicate deviations from Contract Documents**. Do not reproduce Contract Documents or copy standard information as the basis of Shop Drawings. Include the following information:

- Project Name.
- Location.
- Suppliers Name.
- Date.
- Drawing No.
- Specification Section Reference.
- Dimensions.

SECTION 013300 - SUBMITTALS (continued):

Identification of products and materials included.
Compliance with specific standards.
Notation of coordination requirements.
Notation of dimensions established by field measurement.

Sheet Size: Except for templates, patterns and similar full-size Drawings, submit Shop Drawings on sheets at least 8-1/2" x 11" but no larger than 24" x 36".

Initial Submittal: Submit one correctable translucent print and two blue-line print for review; the reproducible print will be returned.

Final Submittal: Submit four (4) blue or black line prints of the original submittal for use by the Architect/Engineer, Owner and Contractor.

Do not use Shop Drawings without a Architects stamp indicating action taken in connection with construction.

The Contractor shall schedule all shop drawing submittals to allow sufficient time for one initial review and two resubmittal reviews.

- 1.11 COORDINATION DRAWINGS are a special type of shop drawing depicting relationship and integration of different construction elements requiring coordination during fabrication or installation to fit and function as intended.

Preparation of coordination drawings is described in these Specifications under "Project Coordination" and may include components previously shown on shop drawings or product data.

Submit for integration of different construction elements. Show sequences and relationships of separate components to avoid conflicts in use of space.

- 1.12 PRODUCT DATA: Collect Product Data into a single submittal for each element or system. Mark each copy to show applicable choices and options. Where Product Data includes information on several products, some of which are not required, mark copies to indicate the applicable information. Include the following information:

Manufacturer's printed recommendations.
Compliance with recognized trade association standards.
Compliance with recognized testing agency standards.
Application of testing agency labels and seals.
Notation of dimensions verified by field measurement.
Notation of coordination requirements.

- A. Submittals: Submit 3 copies. The Architect will retain two and will return the others. **Note:** The Architect will mark only one set for return to the Contractor with action taken and/or modifications required. The Contractor will be responsible to see that any notes made by the Architect are made on all copies.

Unless noncompliance with Contract Documents, the submittal may serve as the final submittal.

- B. Distribution: Furnish copies of final submittal to installers and others required for performance of construction activities. Show distribution on transmittal forms. Do not proceed with installation until an applicable copy of Product Data is in the installers possession.

- 1.13 SAMPLES: Submit Samples for review of kind, color, pattern, and texture, for a final check of these characteristics, and a comparison of these characteristics between the final submittal and the component as

SECTION 013300 - SUBMITTALS (continued):

delivered and installed. Where variations are inherent in the product, submit multiple units that show limits of the variations.

Refer to other Sections for Samples that illustrate details of assembly, fabrication techniques, workmanship, connections, operation and similar characteristics.

Refer to other Sections for Samples to be returned for incorporation in the Work. Such Samples must be undamaged at time of use. On the transmittal, indicate special requests regarding disposition of Sample submittals.

Sample sets may be used to obtain final acceptance of the construction associated with each set.

Preliminary submittals: Where Samples are for selection of characteristics from a range of choices, submit a full set of choices for the product. Preliminary submittals will be reviewed and returned indicating selection and other action.

PART 2 - PRODUCTS (Not Applicable).

PART 3 - EXECUTION (Not Applicable).

PART 4 - SCHEDULES

4.01 The following Submittal Schedule is for ***REFERENCE ONLY***. Items listed may or may not be required for this project.

SUBMITTAL SCHEDULE		
SECTION	TYPE OF SUBMITTAL	DESCRIPTION
00610 - Performance Bond and Labor and Material Bond	Bonds	Performance Bond, Labor and Material Bond
00840 - List of Subcontractors	List	Subcontractors, Suppliers, Principal Manufactures
01027 - Application for Payment	Schedule of Values Application for Payment	Initial and Subsequent Initial and Subsequent
01040 - Project Coordination	List	Staff Names
01300 - Submittals	Construction Schedule Submittal Schedule Daily Construction Reports	
01700 - Project Closeout	Documents Certificate	Record Drawings, Specifications, Submittals, As-Builts, Maintenance Manuals, O & M Instructions OEF Final & Occupancy Inspection
02070 - Selective Demolition	Schedule	Demolition Schedule
02280 - Termite Control	Warranty	Soil Treatment Solution
02510 - Concrete Paving	Shop Drawings	Walkways/Curb Layout
03310 - Concrete	Shop Drawings	Formwork Reinforce Placement/Schedule
04200 - Unit Masonry	Product Data Field Mock-Up	Grout/Mortar, Joint Reinforcement Masonry Wall
04210 - Brick Masonry	Product Data	Grout/Mortar, Joint Reinforcement

SECTION 013300 - SUBMITTALS (continued):

SUBMITTAL SCHEDULE		
SECTION	TYPE OF SUBMITTAL	DESCRIPTION
	Samples Field Mock-Up	Brick, Mortar Brick Wall
05500 - Metal Fabrication	Product Data Shop Drawings Certification	Assembly and Installation Instructions Metal Fabrication Metal and Steel Test Results
06192 - Prefabricated Wood Trusses	Shop Drawings	Sizes, Design Information
06200 - Finish Carpentry	Product Data Samples	
06400 - Interior Architectural Woodwork	Shop Drawings Samples	Casework Plastic Laminate, Hardware
07115 - Sheet Membrane Waterproofing	Product Data	Technical Data and Recommendations
07200 - Building Insulation	Product Data	Each Type of Insulation Required
07600 - Flashing and Sheet Metal	Product Data Guarantee	Roofing and Flashing Materials Maintenance Guarantee
07311 - Asphalt Shingles	Product Data Samples	Manufacturer=s Information
07460 - Vinyl Siding	Product Data Samples	
07900 - Joint Sealers	Product Data Samples Certification	Each Type Sealants Product Test Reports
08110 - Steel Door and Frames	Shop Drawings Schedules	Frames
08211 - Flush Wood Doors	Product Data Shop Drawings Schedule	Wood Doors
08305 - Access Doors	Product Data	Doors
08710 - Finish Hardware	Schedule Product Hardware	Hardware
08800 - Glass and Glazing	Product Data Samples	Glass/Glazing Materials Glass
09200 - Lath and Plaster	Product Data Samples	Installation Instructions Finish, Color Selection
09300 - Tile	Product Data Samples	Tile and Grout Tile
09510 - Acoustical Ceilings	Product Data Samples	Panel/Suspension System
09521 - Acoustical Wall Panels	Product Data Samples	Wall Panels
09650 - Resilient Flooring	Product Data Sample	Tile and Base

SECTION 013300 - SUBMITTALS (continued):

SUBMITTAL SCHEDULE		
SECTION	TYPE OF SUBMITTAL	DESCRIPTION
	Maintenance Instructions Replacement Material	
09680 - Carpeting	Product Data Samples Seaming Plan	Each Carpet Type Each Carpet Type All Carpet Spaces
09900 - Painting	Product Data Samples Mock-Up	Paint Paint Field Application
09950 - Wallcoverings	Product Data Samples	Each Type Wallcovering
10100 - Markerboards, Chalkboards, Tackboards	Product Data Samples	Each Type of Visual Board Tackboard Fabric
10160 - Toilet Partitions	Product Data Shop Drawings Samples	Toilet Partitions Fabrication of Partitions Color and Solid Plastic Selection
10200 - Louvers and Vents	Product Data Shop Drawings Samples	Louvers and Vents Details Color Selection
10440 - Signage	Product Data Schedule Shop Drawings	Signage Sign Layout
10500 - Metal Lockers	Product Data Shop Drawings Samples	Lockers Layout and Details Color and Finish Selection
10800 - Toilet and Bath Accessories	Product Data	Accessories
10990 - Miscellaneous Specialties	Product Data Shop Drawings	Each Item Installation Instructions Fabrication Details (where required)
11132 - Project Screens and T.V. Mounting Brackets	Product Data Shop Drawings	Screens and Monitor Mounts Installation Details
15010 - Mechanical General Provisions		
15400 - Plumbing		
16010 - Electrical General Provisions		

NOTE: Additional Submittals may be requested by the Architect/Engineer.

END OF SECTION 013300

SECTION 014000 - QUALITY REQUIREMENTS

PART 1 - GENERAL

- 1.01 GENERAL: This Section specifies requirements for quality control services. Quality control services include inspections and tests performed by independent agencies, governing authorities, as well as the Contractor.
- 1.02 CONTRACTOR RESPONSIBILITIES: Provide inspections and tests specified or required by governing authorities, except where they are the Owner's responsibility, or are provided by another entity; services include those specified to be performed by an independent agency not by the Contractor. Costs are included in the Contract.

The Contractor shall engage and pay for services of an independent agency, acceptable to the Architect/Engineer to perform inspections and tests specified as Quality Control services.

Retesting: The Contractor is responsible for retesting where results prove unsatisfactory and do not indicate compliance with Contract Documents, regardless of whether the original test was the Contractor's responsibility.

Cost of retesting construction revised or replaced by the Contractor is the Contractor's responsibility, where required tests were performed on original construction.

Associated Services: The Contractor shall cooperate with agencies performing inspections or tests and provide auxiliary services as requested. Notify the agency in advance of operations to permit assignment of personnel. Auxiliary services include but are not limited to:

Provide access to the Work and furnish incidental labor and facilities necessary to facilitate inspections and tests.

Take representative samples of materials that require testing or assist the agency in taking samples.

Provide facilities for storage and curing of samples, and deliver samples to testing laboratories. Provide a preliminary design mix proposed for use for material mixes that require control by the testing agency.

Provide security and protection of samples and test equipment at the Project site.

- 1.03 DUTIES OF THE TESTING AGENCY: The agency engaged to perform inspections and testing of materials and construction shall cooperate with the Architect and Contractor in performance of its duties, and provide qualified personnel to perform inspections and tests.

The agency shall notify the Architect and Contractor promptly of deficiencies observed during performance of its services.

The agency is not authorized to release, revoke, alter or enlarge requirements of the Contract Documents, or approve or accept any portion of the Work.

- 1.04 COORDINATION: The Contractor and each agency engaged to perform inspections and tests shall coordinate the sequence of activities to accommodate services with a minimum of delay. The Contractor and each agency shall coordinate activities to avoid removing and replacing construction to accommodate inspections and tests.

The Contractor is responsible for scheduling inspections, tests, taking samples and similar activities.

SECTION 014000 - QUALITY REQUIREMENTS (continued)

- 1.05 **SUBMITTALS:** The testing agency shall submit a certified written report of each inspection and test to the Architect, in duplicate, unless the Contractor is responsible for the service. If the Contractor is responsible, submit a certified written report of each inspection and test through the Contractor, in triplicate, who shall send two (2) copies to the Architect.

Submit additional copies of each report to the governing authority, when the authority so directs.

Report Data: Written reports of each inspection or test shall include, but not be limited to:

- Date of issue.
- Project title and number.
- Name, address and telephone number of testing agency.
- Testing agency qualifications.
- Dates and locations of samples and tests or inspections.
- Names of individuals making the inspection or test.
- Designation of the Work and test method including applicable industry standards and/or codes.
- Identification of product and Specification Section.
- Complete inspection or test data.
- Test results and an interpretations of test results.
- Ambient conditions at the time of sample-taking and testing.
- Comments or professional opinion as to whether inspected or tested Work complies with Contract Document requirements.
- Name and signature of laboratory inspector or person reviewing results.
- Recommendations on retesting.

- 1.06 **QUALIFICATION FOR SERVICE AGENCIES:** Engage inspection and testing agencies which are prequalified as complying with "Recommended Requirements for Independent Laboratory Qualification" by the American Council of Independent Laboratories, and specialize in the types of inspections and tests to be performed.

Each inspection and testing agency engaged shall be authorized to operate in the State in which the Project is located.

- 1.07 **REPAIR AND PROTECTION:** Upon completion of inspection and testing repair damaged construction and restore substrates and finishes to eliminate deficiencies. Comply with requirements for "Cutting and Patching."

Protect construction exposed by or for quality control service activities, and protect repaired construction.

The Contractor is responsible for repair and protection regardless of the assignment of responsibility for inspection and testing.

END OF SECTION 014000

SECTION 014200 - DEFINITIONS AND STANDARDS

PART 1 - GENERAL

1.01 DEFINITIONS: Basic Contract definitions are included in the General Conditions.

- A. Indicated refers to graphic representations, notes or schedules on Drawings, or Paragraphs or Schedules in Specifications, and similar requirements in Contract Documents. Where terms such as "shown," "noted," "scheduled," and "specified" are used, it is to help locate the reference.
- B. Directed: Terms such as "directed", "requested", "authorized", "selected", "approved", "required", and "permitted" mean "directed by the Architect", "requested by the Architect", and similar phrases. No implied meaning shall be interpreted to extend the Architect's responsibility into the Contractor's supervision of construction.
- C. Approve, used in conjunction with action on submittals, applications, and requests, is limited to the Architect's duties and responsibilities stated in General and Supplementary Conditions. Approval shall not release the Contractor from responsibility to fulfill Contract requirements.
- D. Regulation includes laws, ordinances, statutes and lawful orders issued by authorities having jurisdiction, and rules, conventions and agreements within the construction industry that control performance of the Work, whether lawfully imposed by authorities having jurisdiction or not.
- E. Furnish means "supply and deliver, ready for unloading, unpacking, assembly, installation, and similar operations."
- F. Install describes operations at the site including "unloading, unpacking, assembly, erection, anchoring, applying, working to dimension, protecting, cleaning and similar operations."
- G. Provide means "furnish and install, complete and ready for use."
- H. Installer: "Installer" is the Contractor or an entity engaged by the Contractor, as an employee, subcontractor or sub-subcontractor for performance of a particular construction activity, including installation, erection, application and similar operations. Installers are required to be experienced in the operations they are engaged to perform. The term "experienced," when used with "Installer" means having a minimum of 5 previous Projects similar in size to this Project, and familiar with the precautions required, and with requirements of the authority having jurisdiction.
- I. Project Site is the space available for construction activities, either exclusively or with others performing other construction on the Project. The extent of the Project Site is shown on the Drawings, and may or may not be identical with the description of the land upon which the Project is to be built.
- J. Testing Laboratories: A "testing laboratory" is an independent entity engaged to perform specific inspections or tests, at the Project Site or elsewhere, and to report on, and, if required, to interpret, results of those inspections or tests.

1.02 SPECIFICATION FORMAT: These Specifications are organized into Divisions and Sections based on the Construction Specifications Institute's 48-Division format and MASTERFORMAT 2004 numbering system. Language used in the Specifications is the abbreviated type. Implied words and meanings will be appropriately interpreted. Singular words will be interpreted as plural and plural words interpreted as singular where applicable and where the context so indicates.

SECTION 014200 - DEFINITIONS AND STANDARDS (continued):

Imperative language is used generally. Requirements expressed in the imperative mood are to be performed by the Contractor. At certain locations in the text subjective language is used to describe responsibilities which must be fulfilled indirectly by the Contractor, or by others when so noted. The words "shall be" shall be included by inference wherever a colon (:) is used within a sentence or phrase.

- 1.03 ASSIGNMENT OF SPECIALISTS: Certain construction activities shall be performed by specialists, recognized experts in the operations to be performed. Specialists must be engaged for those activities, and assignments are requirements over which the Contractor has no option. Nevertheless, the ultimate responsibility for fulfilling Contract requirements remains with the Contractor.
- 1.04 DRAWING SYMBOLS: Where not otherwise noted, symbols are defined by "Architectural Graphic Standards", published by John Wiley & Sons, Inc., eighth edition.
- 1.05 MECHANICAL/ELECTRICAL DRAWINGS: Graphic symbols for mechanical and electrical Drawings are defined in a graphic symbol legend on the Construction Documents and are aligned with symbols recommended by ASHRAE. Where appropriate, they are supplemented by symbols recommended by technical associations. Refer instances of uncertainty to the Architect for clarification before proceeding.
- 1.06 APPLICABILITY OF STANDARDS: Except where the Contract Documents include more stringent requirements, applicable industry standards have the same force and effect as if bound or copied into Contract Documents. Such standards are part of the Contract Documents by reference. Individual Sections indicate standards the Contractor must keep available at the Project Site.
- 1.07 PUBLICATION DATES: Where the date of issue of a referenced standard is not specified, comply with the standard in effect as of date of Contract Documents.

Updated Standards: Submit a Change Order proposal where an applicable standard has been revised and reissued after the date of the Contract Documents and before performance of Work. The Architect will decide whether to issue a Change Order to proceed with the updated standard.

- 1.08 CONFLICTING REQUIREMENTS: Where compliance with two or more standards that establish different or conflicting requirements for minimum quantities or quality levels, the most stringent requirement will be enforced. Refer uncertainties as to which quality level is more stringent to the Architect for a decision before proceeding.

Minimum Quantities or Quality Levels: The quantity or quality shown or specified is the minimum to be provided or performed. Indicated values are minimum or maximum values, as appropriate for the requirements. Refer instances of uncertainty to the Architect for decision before proceeding.

- 1.09 COPIES OF STANDARDS: Each entity engaged on the Project shall be familiar with standards applicable to that activity. Copies of applicable standards are not bound with the Contract Documents.

Where copies of standards are needed for performance of a required construction activity, the Contractor shall obtain copies directly from the publication source.

Although copies of standards needed for enforcement of requirements may be part of submittals, the Architect reserves the right to require submittal of additional copies for enforcement of requirements.

- 1.10 ABBREVIATIONS AND NAMES: Where acronyms or abbreviations are used in the Specifications or other Contract Documents they mean the recognized name of the trade association, standards generating organization, authority having jurisdiction or other entity applicable. Refer to the "Encyclopedia of Associations," published by Gale Research Co., available in most libraries.

SECTION 014200 - DEFINITIONS AND STANDARDS (continued):

- 1.11 PERMITS, LICENSES, AND CERTIFICATES: For the Owner's records, submit copies of permits, licenses, certifications, inspection reports, releases, jurisdictional settlements, notices, receipts for fee payments, judgments, and similar documents, correspondence and records established in conjunction with compliance with standards and regulations bearing upon performance of the Work.

END OF SECTION 014200

SECTION 015000 - TEMPORARY FACILITIES

PART 1 - GENERAL

- 1.01 RELATED DOCUMENTS: Drawings and General Provisions of Contract, including General and Supplementary Conditions and other Division 1 Specification Sections, apply to this section.
- 1.02 SUMMARY: This Section specifies temporary services and facilities, including utilities, construction and support facilities, security and protection. Provide facilities ready for use. Maintain, expand and modify as needed. Remove when no longer needed, or replaced by permanent facilities.
- Temporary facilities required include but are not limited to water service and distribution, temporary electric power and light, storage sheds, sanitary facilities and temporary enclosures, barricades, warning signs, lights and environmental protection.
- 1.03 USE CHARGES: Cost or use charges for temporary facilities are not chargeable to the Owner or Architect, and will not be accepted as a basis of claims for a Change Order.
- 1.04 REGULATIONS: Comply with all applicable local, state, and federal laws and regulations.
- 1.05 STANDARDS: Comply with NFPA Code 241, "Building Construction and Demolition Operations", ANSI-A10 Series standards for "Safety Requirements for Construction and Demolition", and NECA Electrical Design Library "Temporary Electrical Facilities" and OSHA.
- A. Refer to "Guidelines for Bid Conditions for Temporary Job Utilities and Services", prepared by AGC and ASC.
- B. Electrical Service: Comply with NEMA, NECA and UL standards and regulations for temporary electric service. Install service in compliance with National Electric Code (NFPA 70).
- 1.06 INSPECTIONS: Arrange for authorities having jurisdiction to inspect and test each temporary utility before use. Obtain required certifications and permits.
- 1.07 CONDITIONS OF USE: Keep facilities clean and neat. Operate in a safe and efficient manner. Take necessary fire prevention measures. Do not overload, or permit facilities to interfere with progress. Do not allow hazardous, dangerous or unsanitary conditions, or public nuisances to develop or persist on the site.
- 1.08 MATERIALS AND EQUIPMENT: Provide new materials and equipment; if acceptable to the Architect, undamaged previously used materials and equipment in serviceable condition may be used. Provide materials and equipment suitable for the use intended.
- A. Tarpaulins: Waterproof, fire-resistant, UL labeled tarpaulins with flame-spread rating of 15 or less. For temporary enclosures provide translucent nylon reinforced laminated polyethylene or polyvinyl chloride fire retardant tarpaulins.
- B. Temporary / Construction Fencing: 11-gage, galvanized 2-inch, chain link fabric fencing 6-feet high with galvanized steel pipe posts, 1-1/2" I.D. for line posts and 2-1/2" I.D. for corner posts.
- 1.09 TEMPORARY UTILITY INSTALLATION: Engage the local utility company to install temporary service or connect to existing service. Arrange for a time when service can be interrupted to make connections. Provide adequate capacity at each stage of construction. Combined use of temporary and existing power and water is anticipated for this project.
- A. Water Service: Install water service and distribution piping of sizes and pressures adequate for construction. Sterilize water piping prior to use. **Existing service may be used.**

SECTION 015000 - TEMPORARY FACILITIES (continued):

- B. Electric Power Service: Provide weatherproof, grounded electric power service and distribution system of sufficient size, capacity, and power characteristics. Include meters, transformers, overload protected disconnects, automatic ground-fault interrupters and main distribution switch gear. Install service underground, if possible. **Existing service may be used.**
1. Power Distribution System: Install wiring overhead, and rise vertically where least exposed to damage.
 2. Electrical Outlets: Provide properly configured NEMA polarized outlets. Provide outlets equipped with ground-fault circuit interrupters, reset button and pilot light, for connection of power tools and equipment.
 3. Electrical Power Cords: Provide grounded extension cords; use "hard-service" cords where exposed to traffic.
- C. Lighting: Provide temporary lighting with local switching to fulfill security requirements and provide illumination for construction operations and traffic conditions.
1. Lamps and Light Fixtures: Provide general service incandescent lamps. Provide guard cages or tempered glass enclosures, where exposed to breakage. Provide exterior fixtures where exposed to moisture.
- D. Telephones: Provide temporary telephone service for personnel engaged in construction. Post a list of important telephone numbers.
- E. Sewers and Drainage: If sewers are available, provide temporary connections to remove effluent. If sewers are not available or cannot be used, provide drainage ditches, or similar facilities.

Filter out construction debris and other contaminants that might clog sewers or pollute waterways before discharge. Provide earthen embankments and similar barriers in and around excavations and subgrade construction to prevent flooding by runoff of storm water from heavy rains.

Comply with all City and County requirements for storm water runoff.

- 1.10 TEMPORARY CONSTRUCTION AND SUPPORT FACILITIES INSTALLATION: Locate for easy access. Maintain facilities until Substantial Completion. Remove prior to Substantial Completion. Personnel remaining after Substantial Completion will be permitted to use permanent facilities, if acceptable to the Owner.
- A. Temporary Roads and Paved Areas: Construct and maintain temporary roads and paved areas adequate for construction operations. Locate temporary roads where they do not interfere with construction activities.
Dust Control: If, in the opinion of the Owner or Architect it is necessary to control dust during construction period, the Contractor shall furnish and spread water or calcium chloride at points where dust is a nuisance or as directed by the Architect, at no additional cost to the Owner.
- B. Field Offices: **(OPTIONAL)** Provide field offices of size required to accommodate personnel, including copier, telephone and fax line. In addition provide a conference table, plans rack, 3' x 5' desk, table and stool for use by the Architect, meeting space, and restroom. Field office is to be provided with air conditioning. Keep clean and orderly for use for small progress meetings.
- C. Storage and Fabrication Sheds: Install sheds, equipped to accommodate materials and/or existing equipment involved. Sheds may be open shelters.

SECTION 015000 - TEMPORARY FACILITIES (continued):

- D. Sanitary facilities include temporary toilets and drinking water fixtures. Comply with regulations and health codes for the type, number, location, operation and maintenance of fixtures. Install where facilities will best serve the Project. Provide toilet tissue, paper towels, paper cups and similar disposable materials for each facility. Provide covered waste containers for used material.
- E. Toilets: Install self-contained single-occupant toilet units of the chemical, aerated recirculation, or combustion type, properly vented and fully enclosed with a glass fiber reinforced polyester shell or similar nonabsorbent material. Use of pit-type privies will not be permitted. Under no circumstances will construction personnel use existing toilet facilities.
- F. Drinking Water Facilities: Provide containerized tap-dispenser type drinking water units.
- G. Dewatering Facilities and Drains: For temporary drainage and dewatering operations not associated with construction, comply with requirements of applicable Division-2 Sections. Where feasible, utilize the same facilities. Maintain excavations and construction free of water.
- H. Temporary Enclosures: Provide temporary enclosure for protection of construction from exposure, foul weather, other construction operations and similar activities. Coordinate enclosure with ventilating and material drying or curing requirements to avoid dangerous conditions.

Install tarpaulins securely, with incombustible framing. Close openings through floor or roof decks and horizontal surfaces with load-bearing construction.

- I. Collection and Disposal of Waste: Collect waste daily. Comply with NFPA 241 for removal of combustible waste. Enforce requirements strictly. Handle hazardous, dangerous, or unsanitary waste materials separately from other waste by containerizing properly. Dispose in a lawful manner.

1.11 SECURITY AND PROTECTION FACILITIES INSTALLATION: Except for use of permanent fire protection as soon as available, do not change from use of temporary security and protection facilities to permanent facilities until Substantial Completion.

- A. Fire Protection: Until fire protection is supplied by permanent facilities, install and maintain temporary fire protection of types needed to protect against predictable and controllable fire losses. Comply with NFPA 10 "Standard for Portable Fire Extinguishers," and NFPA 241 "Standard for Safeguarding Construction, Alterations and Demolition Operations." Consideration should be given to existing fire hydrant locations.
- B. Fire Extinguishers: Provide hand-carried, portable UL-rated, class "A" fire extinguishers for temporary offices and similar spaces. In other locations provide hand-carried, portable, UL-rated, class "ABC" dry chemical extinguishers. Locate fire extinguishers where effective for the intended purpose.

Maintain unobstructed access to fire extinguishers, fire hydrants, temporary fire protection facilities, and other access routes for fighting fires. Prohibit smoking in hazardous fire exposure areas.

Store combustible materials in containers in fire-safe locations.

Provide supervision of welding operations, combustion type temporary heating units, and sources of fire ignition.

- C. Barricades, Warning Signs and Lights: Comply with standards and code requirements for erection of barricades. Paint appropriate warning signs to inform personnel and the public of the hazard being protected against. Where needed provide lighting, including flashing lights. Temporary,

SECTION 015000 - TEMPORARY FACILITIES (continued):

portable or metal barricades and structures shall be constructed over all open trench areas intersecting student walkways. Walkway structures over trenches shall be of sturdy construction with handrails and be handicap accessible.

- D. Security Enclosure and Lockup: Install temporary enclosure of partially completed areas of construction. Provide locking entrances to prevent unauthorized entrance, vandalism and theft. Where materials and equipment must be stored, provide a secure lockup.
- E. Enclosure Fence: When excavation begins, install an enclosure fence with lockable entrance gates where indicated, or if not indicated, enclose the entire site or the portion sufficient to accommodate operations. Provide open-mesh, chain-link fencing with posts set in a compacted mixture of gravel and earth.
- F. Environmental Protection: Operate temporary facilities and conduct construction by methods that comply with environmental regulations, and minimize the possibility that air, waterways and subsoil might be contaminated or polluted. Restrict use of noise making tools and equipment to hours that will minimize complaints.

- 1.12 OPERATION: Enforce strict discipline in use of temporary facilities. Limit availability to intended use to minimize abuse. Maintain facilities in good operating condition until removal. Protect from damage by freezing temperatures and the elements.

Maintain operation of enclosures, heating, cooling, humidity control, ventilation and similar facilities on a 24-hour day basis to achieve indicated results and to avoid damage.

Prevent piping from freezing. Maintain markers for underground lines. Protect from damage during excavation operations.

- 1.13 TERMINATION AND REMOVAL: Remove each facility when the need has ended, or replaced by a permanent facility, or no later than Substantial Completion. Complete or restore construction delayed because of interference with the facility. Repair damaged Work, clean exposed surfaces and replace construction that cannot be satisfactorily repaired.

Temporary facilities are property of the Contractor.

At Substantial Completion, renovate permanent facilities used during the construction period, including but not limited to:

Replace air filters and clean inside of ductwork and housings.
Replace worn parts and parts subject to unusual operating conditions.
Replace burned out lamps.

END OF SECTION 015000

NOTE:

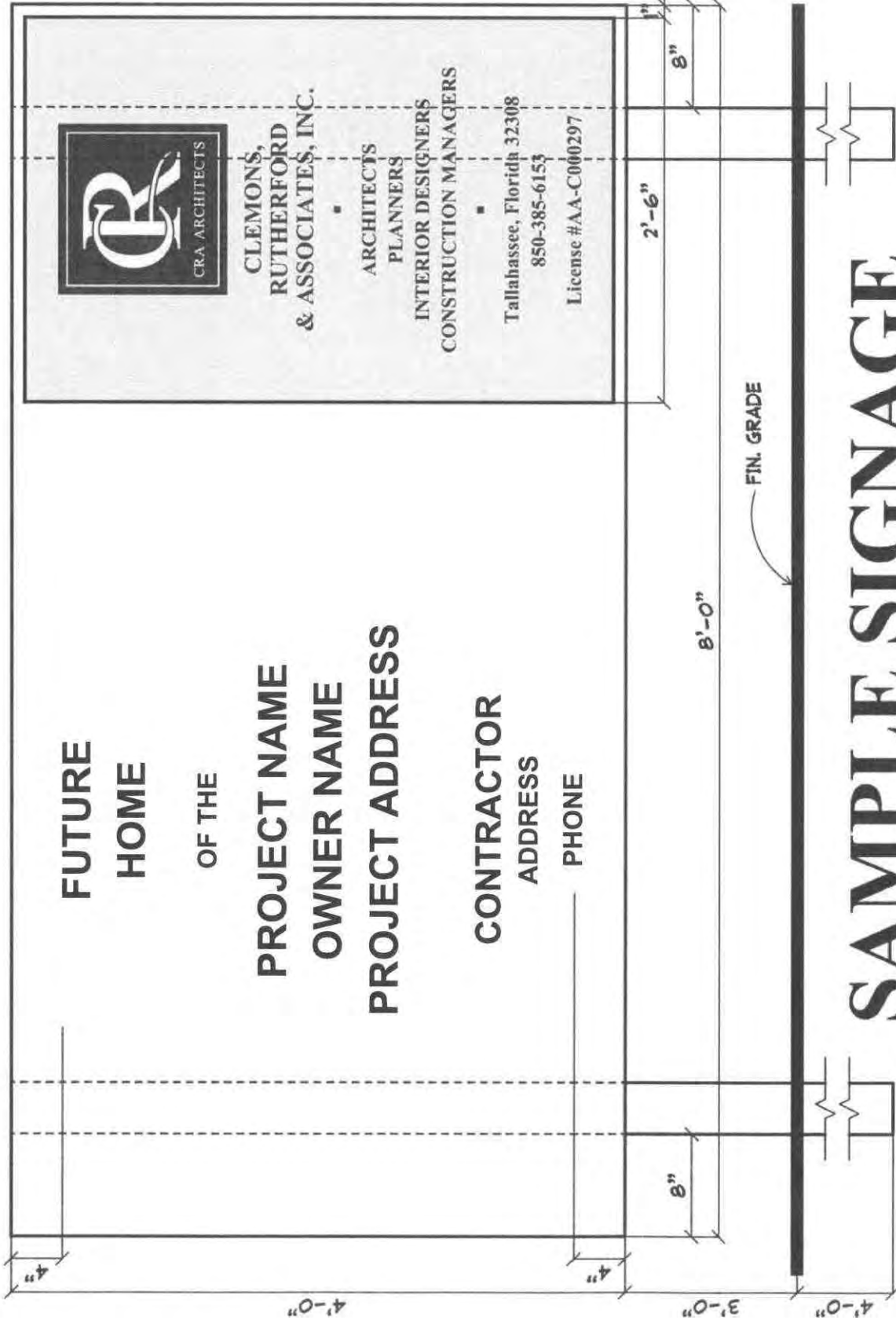
CONTRACTOR AND / OR SIGN SHOP TO CONTACT CRA TO REQUEST AN ELECTRONIC COPY OF IMAGE PRIOR TO PRINTING.

FINISH:

ALKYD PRIMER & INDUSTRIAL ENAMEL. PANELS ARE PAINTED ON BOTH SIDES & ALL EDGES. FINISH COAT ON FACE SIDE IS DOUBLED COATED.

COLORS:

GRAY BACKGROUND (PMS 7541U)
NAVY BLUE LOGO & LETTERING (PMS 2767U)



NOTES:

1. LETTERING STYLES SHALL BE ARIAL, UNLESS NOTED OTHERWISE.
2. ALL COLORS ARE TO BE SELECTED BY THE ARCHITECT
3. PLYWOOD SHALL BE 3/4" M.D.O. EXTERIOR GRADE
4. CONTRACTOR SHALL FURNISH SIGN.
5. PROVIDE SHOP DRAWING LAYOUT FOR ARCHITECTS' REVIEW PRIOR TO PAINTING SIGN.
6. ARCHITECT TO SELECT LOCATION OF SIGN.

CLEMONS, RUTHERFORD & ASSOCIATES, INC.

ARCHITECTS | PLANNERS | INTERIOR DESIGNERS | CONSTRUCTION MANAGERS

2027 Thomasville Road, Tallahassee, Florida 32308

p: 850-385-6153 | f: 850-386-8420 | www.craarchitects.com



SECTION 015500 - MATERIALS AND EQUIPMENT

PART 1 - GENERAL

1.01 DEFINITIONS

- A. Definitions used in this Article are not intended to change the meaning of other terms used in the Contract Documents, such as "specialties," "systems," "structure," "finishes," "accessories," and similar terms. Such terms are self-explanatory and have well-recognized meanings in the construction industry.
- B. "Products" are items purchased for incorporation in the Work, whether purchased for the Project or taken from previously purchased stock. The term "product" includes the terms "material," "equipment," "system," and terms of similar intent.
- C. "Named Products" are items identified by the manufacturer's product name, including make or model number or other designation, shown or listed in the manufacturer's published product literature, that is current as of the date of the Contract Documents.
- D. "Materials" are products substantially shaped, cut, worked, mixed, finished, refined or otherwise fabricated, processed, or installed to form a part of the Work.
- E. "Equipment" is a product with operational parts, whether motorized or manually operated, that requires service connections, such as wiring or piping.

1.02 QUALITY ASSURANCE

- A. Source Limitations: To the fullest extent possible, provide products of the same kind from a single source.
- B. Compatibility of Options: When the Contractor is given the option of selecting between two or more products for use on the Project, the product selected shall be compatible with products previously selected, even if previously selected products were also options.
- C. Nameplates: Except for required labels and operating data, do not attach or imprint manufacturer's or producer's nameplates or trademarks on exposed surfaces of products that will be exposed to view in occupied spaces or on the exterior.
- D. Labels: Locate required product labels and stamps on concealed surfaces or, where required for observation after installation, on accessible surfaces that are not conspicuous.
- E. Equipment Nameplates: Provide a permanent nameplate on each item of service-connected or power-operated equipment. Locate on an easily accessible surface that is inconspicuous in occupied spaces. The nameplate shall contain the following information and other essential operating data:

Name of product and manufacturer.

Model and serial number.

Capacity.

Speed.

Ratings.

SECTION 015500 - MATERIALS AND EQUIPMENT (continued):

1.03 PRODUCT DELIVERY, STORAGE, AND HANDLING

- A. Deliver, store, and handle products according to the manufacturer's recommendations, using means and methods that will prevent damage, deterioration, and loss, including theft.
- B. Coordinate delivery with installation time to assure minimum holding time for items that are flammable, hazardous, easily damaged, or sensitive to deterioration, theft, and other losses; and to prevent overcrowding of construction spaces.
- C. Deliver products to the site in undamaged condition in the manufacturer's original sealed container or other packaging system, complete with labels and instructions for handling, storing, unpacking, protecting, and installing.
- D. Inspect products upon delivery to ensure compliance with the Contract Documents and to ensure that products are undamaged and properly protected.
- E. Store products at the site in a manner that will facilitate inspection and measurement of quantity or counting of units.
- F. All new installed materials shall be sealed from moisture penetration at the end of each day.

PART 2 - PRODUCTS

2.01 PRODUCT SELECTION

- A. General Product Requirements: Provide products that comply with the Contract Documents, that are undamaged and, unless otherwise indicated, new at the time of installation. Discontinued items will not be accepted.
 - 1. Provide products complete with accessories, trim, finish, safety guards, and other devices and details needed for a complete installation and the intended use and effect.
 - 2. Standard Products: Where available, provide standard products of types that have been produced and used successfully in similar situations on other projects.
- B. Product Selection Procedures: The Contract Documents and governing regulations govern product selection. Procedures governing product selection include the following:
 - 1. Semiproprietary Specification Requirements: Where Specifications name two or more products or manufacturers, provide one of the products indicated.

Where Specifications specify products or manufacturers by name, accompanied by the term "**or equal**" or "**or approved equal**", comply with the Contract Document provisions concerning "substitutions" to obtain approval for use of an unnamed product.
 - 2. Descriptive Specification Requirements: Where Specifications describe a product or assembly, listing exact characteristics required, with or without use of a brand or trade name, provide a product or assembly that provides the characteristics and otherwise complies with Contract requirements.
 - 3. Performance Specification Requirements: Where Specifications require compliance with performance requirements, provide products that comply with these requirements and are recommended by the manufacturer for the application indicated.

SECTION 015500 - MATERIALS AND EQUIPMENT (continued):

Manufacturer's recommendations may be contained in published product literature or by the manufacturer's certification of performance.

4. Compliance with Standards, Codes, and Regulations: Where Specifications only require compliance with an imposed code, standard, or regulation, select a product that complies with the standards, codes, or regulations specified.
5. Visual Matching: Where Specifications require matching an established Sample (match existing), the Architect's decision will be final on whether a proposed product matches satisfactorily.

Where no product is available within the specified category, matches satisfactorily and complies with other specified requirements; comply with provisions of the Contract Documents concerning "substitutions" (Section 01631 - Product Substitutions) for selection of a matching product in another product category.

6. Visual Selection: Where specified product requirements include the phrase "... as selected from manufacturer's standard colors, patterns, textures ..." or a similar phrase, select a product and manufacturer that complies with specified requirements. The Architect will select the color, pattern, and texture from the product line selected. Any selections within the product line which are unavailable, no longer make or superseded by another should be so marked.

PART 3 - EXECUTION

3.01 INSTALLATION OF PRODUCTS

- A. Comply with manufacturer's instructions and recommendations for installation of products in the applications indicated. Anchor each product securely in place, accurately located and aligned with other Work.
- B. Clean exposed surfaces and protect as necessary to ensure freedom from damage and deterioration at time of Substantial Completion.

END OF SECTION 015500

SECTION 017700 – CLOSEOUT PROCEDURES

PART 1 - GENERAL

- 1.01 SUBSTANTIAL COMPLETION: (See Section 000700 - General Conditions, Section 9.8). Before requesting inspection for certification of Substantial Completion, complete the following:
- A. Change-over permanent locks and transmit keys to the Owner.
 - B. Complete start-up testing of systems, and instruction of the Owner's personnel. Remove temporary facilities from the site, along with construction tools, mock-ups, and similar elements.
 - C. Complete final clean up. Touch-up and repair and restore marred exposed finishes.
- 1.02 INSPECTION PROCEDURES: When the Contractor considers the work substantially complete, he shall prepare and submit a comprehensive list of items to be completed and/or corrected to the Architect. The Contractor shall proceed to promptly complete and/or correct all items on the list.
- A. Upon receipt of Contractor's list, the Architect will make an inspection or inform the Contractor of work to be completed before an inspection will be conducted.
 - B. When the work is substantially complete, the Architect will prepare the Certificate of Substantial Completion which shall establish the date of Substantial Completion.
 - C. Results of the completed inspection will form the basis of requirements for final acceptance, **including any items discovered at a later date considered necessary to be completed for final.**
- 1.03 FINAL ACCEPTANCE: (See Section 000700 - General Conditions Section 9.10). Before requesting inspection for certification of final acceptance and final payment, complete the following:
- A. Submit a copy of the final inspection list stating that each item has been completed or otherwise resolved for acceptance.
 - B. Submit specific warranties, workmanship bonds, maintenance agreements, final certifications and similar documents.
 - C. Submit record drawings, maintenance manuals, damage or settlement survey, and similar record information.
 - D. Refer to Section 012900 - Application For Payment - Final Payment Application.
 - E. Provide the Architect with Final Statement of Compliance, for the Owner.
- 1.04 REINSPECTION PROCEDURE (if required): The Architect will re-inspect the Work upon receipt of notice that the Work has been completed, except items whose completion has been delayed because of circumstances acceptable to the Architect.
- A. Upon completion of re-inspection, the Architect will then prepare a certificate of final acceptance, or advise the Contractor of work that is incomplete or of obligations that have not been fulfilled but are required for final acceptance. If necessary, re-inspection will be repeated.
- 1.05 RECORD DRAWINGS: Maintain a clean, undamaged set of blue or black line white-prints of Contract Drawings and Shop Drawings. Mark-up these drawings to show the actual installation where installation varies from that shown originally. Mark whichever drawing is most capable of showing conditions accurately. Give particular attention to concealed elements that would be difficult to measure and record at a later date.

SECTION 017700 – CLOSEOUT PROCEDURES (continued):

- A. Organize record drawing sheets into manageable sets, bind with durable paper cover sheets, and print suitable titles, dates and other identification on the cover.
 - B. Do not use Project Record Documents for construction purposes. Maintain Record Documents in good order and in a clean, dry, legible condition, protected from deterioration and lost. Provide access to Project Record Documents for Architect's reference during normal working hours.
 - B. Upon completion of the Work, submit Record Drawings (red-line field as-builts) to the Architect for Owner's records.
- 1.06 **PROJECT RECORD SPECIFICATIONS:** Maintain one copy of the Project Manual, including addenda. Mark-up to indicate the actual product installation where installation varies from that indicated in Specifications, addenda, and contract modifications. Give particular attention to substitutions, selection of options and similar information on elements that are concealed or cannot be readily discerned later by direct observation. Note related record drawing information and Product Data.
- A. Upon completion of the Work, submit record Drawings and Specifications to the Architect for the Owner's records.
- 1.07 **PROJECT AS-BUILT DRAWINGS:** The Contractor shall, at his own expense, hire Architect of Record (CRA) to prepare as-built drawings. The Contractor shall provide to the Architect record drawings and record specifications. The Contractor is solely responsible for the content of the record drawings and the as-built documents. As-built drawings shall comply with the following:
- A. Show the actual locations of all components, including depth below grade, along with any changes and/or modifications to the Contract Drawings.
 - B. All dimensions and elevations, including invert elevations, shall be verified by field measurements.
 - C. The Contractor is cautioned to make all necessary measurements and elevations during installation to accurately locate all concealed items.
 - D. As-Built Survey: Contractor shall provide signed and sealed As-Built Survey of existing grades and structures as required by authorities having jurisdictions.
- 1.08 **MAINTENANCE MANUALS:** Organize maintenance data into sets of manageable size. Bind in individual heavy duty 2-inch, 3-ring vinyl covered binders, with pocket folders for folded sheet information. Mark identification on front and spine of each binder. Include the following information:
- | | |
|-----------------------------------|---------------------------|
| Emergency instructions. | Spare parts list. |
| Copies of warranties. | Wiring diagrams. |
| Recommended "turn around" cycles. | Inspection procedures. |
| Shop Drawings and Product Data. | Fixture lamping schedule. |
- 1.09 **OPERATING AND MAINTENANCE INSTRUCTIONS:** Arrange for the installer of equipment that requires regular maintenance to meet with the Owner's personnel to provide instruction in proper operation and maintenance. Include a detailed review of the following:
- | | |
|-----------------------|--|
| Maintenance manuals. | Spar parts and materials. |
| Tools. | Lubricants. |
| Control sequences. | Hazards. |
| Warranties and bonds. | Maintenance agreements and similar continuing commitments. |

SECTION 017700 – CLOSEOUT PROCEDURES (continued):

As part of instruction for operating equipment, demonstrate the following procedures:

Start-up and shutdown.	Emergency operations.
Noise and vibration adjustments.	Safety procedures.

All operation and training sessions shall be video taped and two (2) copies provided to Owner. Verify with Owner the appropriate format of taping that should be used.

- 1.10 **FINAL CLEANING:** Employ experienced workers for final cleaning. Clean each surface to the condition expected in a commercial building cleaning and maintenance program. Complete the following, as a minimum before requesting inspection for certification of Substantial Completion:
- A. Remove labels that are not permanent labels.
 - B. Clean transparent materials. Remove glazing compound. Replace chipped or broken glass.
 - C. Clean exposed hard surfaced finishes to a dust free condition, free of stains, films and similar foreign substances. Restore reflective surfaces to their original reflective condition. Leave concrete floors broom clean.
 - D. Vacuum carpeted surfaces.
 - E. Wipe surfaces of mechanical and electrical equipment. Remove excess lubrication. Clean plumbing fixtures to a sanitary condition. Clean light fixtures and lamps.
 - F. Clean the site of rubbish, litter and other foreign substances. Sweep paved areas; remove stains, spills and other foreign deposits. Rake grounds that are neither paved nor planted to a smooth even textured surface.
- 1.11 **REMOVAL OF PROTECTION:** Remove temporary protection and facilities.
- 1.12 **COMPLIANCE:** Comply with regulations of authorities having jurisdiction and safety standards for cleaning. Remove waste materials from the site and dispose of in a lawful manner.

END OF SECTION 017700

SECTION 022600 - HAZARDOUS MATERIAL ABATEMENT / TESTING / MONITORING

PART 1 - GENERAL

1.01 SCOPE OF WORK

- A. There is no hazardous materials, but the Contractor shall be required to provide the 10-Working Notification to Tracy White with FDEP at 850-245-2984. Attached is a copy of the report for any questions from FDEP. A copy of the report shall be on site in case of a visit from FDEP.

A copy of the survey is included at the end of this section.

END OF SECTION 022600

Tallahassee Office

3642 Peddie Drive
Tallahassee, FL 32303

Tel: (850) 576-4652
Fax: (850) 576-4710
www.soeearth.com



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CLEMONS, RUTHERFORD & ASSOCIATES, INC.
2027 Thomasville Rd.
Tallahassee, FL 32312

July 9, 2016
SESI Job No.: T16-116
SESI Asbestos Business
No.: AZ-0000092
EPA TSCA LBP
Firm No.: FL-15608-3

ATTENTION: Mr. Michael Eaton

SUBJECT: Asbestos Survey & LBP Testing Report for the Leon County Medical Examiner's Building at 501 Appleyard Drive in Tallahassee, Florida

Dear Mr. Eaton:

As requested, **Southern Earth Sciences Inc.**, has performed an asbestos renovation survey (accessible materials only) and LBP Testing of the interior and exterior of the former Leon County Medical Examiner's Building. SESI performed LBP Testing on the structure using an RMD LPA-1 X-Ray Fluorescence Detector (XRF).

Asbestos is a naturally occurring fibrous mineral that has many beneficial properties. It is resistant to acids and heat, and does not conduct electricity or heat well. It is because of these features that it was widely used in buildings constructed prior to 1980 (OSHA Presumed ACM). Even today asbestos containing building materials find their way into new construction from materials shipped into the United States from other countries. Asbestos was used in over 3,000 types of construction materials and as previously discussed is still a common additive to building materials.

REGULATORY

The Asbestos Hazard and Emergency Response Act (AHERA) is a Federal Law that describes standards methods for asbestos inspections. This act initially applied to public schools and has been accepted as a standard for the industry. This survey follows the sampling protocol for AHERA surveys.

The Occupational Safety and Health Administration (OSHA) is the regulatory agency for establishing worker safety. This survey satisfies OSHA requirements in 29 CFR 1910.1001 (General Industry) and 29 CFR 1926.1101 (Construction Industry). OSHA Construction Industry Standard 29 CFR 1926.62 provides work practices related to lead paint & lead dust hazards.

The US Environmental Protection Agency (EPA) has established regulatory requirements for asbestos surveys under the National Emission for Hazardous Air Pollutants (Asbestos NESHAPS) 40 CFR Part 61. The NESHAPS requires asbestos surveys be performed for both friable and non-friable materials in buildings prior to renovation or demolition activities. This survey meets the requirements in the Asbestos NESHAPS for asbestos surveys.

DEFINITIONS

Asbestos Containing Materials (ACM): Building materials used for construction of a structure that are known or are suspect for containing asbestos.

Asbestos: Asbestos is the asbestiform varieties of chrysotile, crocidolite, amosite, anthophyllite, tremolite, and actinolite.

Asbestos Inspection: An evaluation performed by a trained and E.P.A. certified inspector to determine the presence or absence of Asbestos-containing materials. Asbestos inspectors engage in the survey and assessment of ACBM.

Category I non-friable ACM: asbestos-containing packings, gaskets, resilient floor covering and asphalt products.

Category II non-friable ACM: any material, excluding Category I ACM, that when dry, cannot be crumbled, pulverized, or reduced to powder by hand pressure.

Demolition: the removal of load-bearing walls or structural components (including roofing).

Lead-Based Paint (LBP): paint and other coating materials that contains $\geq 1.0 \text{ mg/cm}^2$ by XRF or $\geq 0.5\%$ lead by weight by laboratory analysis; usually analyzed by Atomic Absorption Spectroscopy (AAS) analysis.

Regulated Asbestos Containing Material (RACM): (a) Friable asbestos materials, (b) Category I non-friable ACM that has become friable, (c) Category I non-friable ACM that will be or has been subjected to sanding, grinding, cutting, or abrading, or, (d) Category II non-friable ACM that has a high probability of becoming or has become crumbled, pulverized, or reduced to powder by the forces expected to act on the material in the course of demolition or renovation operations regulated by NESHAPS.

Renovation: the removal of any other building components other than load-bearing walls or structural components.

Toxicity Characteristic Leachate Procedure (TCLP): TCLP Lead (Pb) is a laboratory procedure performed on waste streams from lead abatement projects (excluding residential) to determine the proper disposal of waste (hazardous waste or construction debris).

PHYSICAL SURVEY

On May 19, 2016, a total of 21 bulk samples of suspect asbestos-containing materials (ACM) were collected for analysis. The samples were sent to Carolina Environmental, Inc., for analysis by Polarized Light Microscopy (PLM); sample sheets are attached to this report. SESI performed LBP Testing on accessible surfaces using an RMD LPA-1 X-Ray Fluorescence Detector (XRF).

The building was a block structure built on-grade with a concrete slab (non-ACM) and a metal roof. The metal roof had white caulking (non-ACM) and gray putty (non-ACM) on the roof seams and base of the roof vents/sky lights. There was also black sealant (non-ACM) on some of the skylights. The interior of the structure consisted mainly of exposed block & rollup metal doors. There was no visible suspect thermal system insulation (TSI) on the piping. There was tan duct mastic on metal ducting above the restrooms. Some of the restroom walls & divider walls above the restrooms had drywall (DW/non-ACM) with joint compound (JC/non-ACM). The restrooms & entry foyer had 12" vinyl floor tile (non-ACM) with mastic (non-ACM) on the concrete deck. There were also vinyl baseboards & mastic (VBD/non-ACM) in these areas.

SUMMARY OF ACM

An asbestos containing material is defined as a material that contains more than 1- percent asbestos by volume. Asbestos containing materials are placed into two categories, friable and non-friable. Friable ACM is defined as a material that can be pulverized to powder by hand pressure when dry. A summary of the analysis of suspect bulk samples collected during the survey is located on the attached Table 1.

FRIABLE ACM – NO FRIABLE ACM WAS NOTED.

CATEGORY 1 NON-FRIABLE ACM – NO CATEGORY 1 ACM WAS NOTED

CATEGORY 2 NON-FRIABLE ACM – NO CATEGORY 2 ACM WAS NOTED.

SUMMARY OF LBP

SESI performed LBP testing on various accessible interior and exterior surfaces of the structure. No LBP was identified on any surfaces (walls, ceilings, baseboards, doors/casings, etc.) or components (ceramic tiles, sinks, toilets & urinals) tested using the XRF.

RECOMMENDATIONS

A 10-working day notification to the Florida Department of Environmental Protection (DEP) is not required if demolition activities (removal of load bearing components or roofing) is not to be performed on the structure and since regulated quantities of ACM (RACM) were not present.

A TCLP for Lead on the waste streams of the renovation is not required .

GENERAL COMMENTS

This survey has been performed to identify asbestos containing materials (ACM) on the building and is not intended as an abatement specification with drawings. Quantities of materials would be verified during the pre-bid by the Contractor.

Comments and observations given above reflect an opinion as to the various materials and conditions visually observed during the inspections and should not be construed as a representation or warranty expressed or implied, as to scope, thoroughness or accuracy of the inspection.

Locating and identifying materials containing asbestos in buildings is a difficult and time-consuming task. All buildings have hidden spaces which may not be immediately obvious to a surveyor who is not intimately familiar with the building. Complicating this task is the fact that asbestos was used in many forms and in many types of materials in the construction of buildings. In some of these materials, asbestos is present, not as an intentional ingredient, but as a contaminant.

Although trained and certified inspectors were used in attempting to locate and identify materials potentially containing asbestos, we do not warrant that all materials containing asbestos have been identified. It is possible that there are materials containing asbestos that were not visible or accessible to the surveyor or, for various reasons, were not sampled.

A conscious effort is made to identify all suspect materials. There is a possibility that conditions or materials may exist which could not be identified during our survey due to physical inaccessibility and the use of nondestructive sampling methods. Materials that typically do not contain asbestos have not been sampled. These materials include but are not limited to plastics, wood, fiberglass, etc. Conclusions and recommendations given in this report are based upon our interpretation of current regulatory standards. Changes in regulatory standards may require changes in our conclusions and recommendations.

We appreciate the opportunity to be of service to you on this project should require additional information, please advise.

Sincerely,

SOUTHERN EARTH SCIENCES, INC.



Roy L. Russell
Asbestos Dept. Manager - LEP #60/CIEC
EPA TSCA LBP Inspector No.: FL-I-5950-5



Mark E. Wilson, P.E.
Florida State Licensed Asbestos Consultant
SESI Asbestos Business No.: ZA-0000092
Florida Licensed Asbestos Consultant No.: AX85
07-09-16

LABORATORY DATA



May 23, 2016

Southern Earth Sciences, Inc.
3642 Peddie Drive
Tallahassee, FL 32303

CLIENT PROJECT: Leon Co. Medical Examiner Bldg - Survey; T16-116
CEI LAB CODE: A16-4723

Dear Customer:

Enclosed are asbestos analysis results for PLM Bulk samples received at our laboratory on May 20, 2016. The samples were analyzed for asbestos using polarizing light microscopy (PLM) per the EPA 600 Method.

Sample results containing >1% asbestos are considered asbestos-containing materials (ACMs) per EPA regulatory requirements. The detection limit for the EPA 600 Method is <1% asbestos by weight as determined by visual estimation.

Thank you for your business and we look forward to continuing good relations. If you have any questions, please feel free to call our office at 919-481-1413.

Kind Regards,

A handwritten signature in black ink, appearing to read "Tianbao Bai".

Tianbao Bai, Ph.D., CIH
Laboratory Director





ASBESTOS ANALYTICAL REPORT
By: Polarized Light Microscopy

Prepared for

Southern Earth Sciences, Inc.

CLIENT PROJECT: Leon Co. Medical Examiner Bldg - Survey; T16-116

CEI LAB CODE: A16-4723

TEST METHOD: EPA 600 / R93 / 116 and EPA 600 / M4-82 / 020

REPORT DATE: 05/23/16

TOTAL SAMPLES ANALYZED: 21

SAMPLES >1% ASBESTOS:

TEL: 866-481-1412

www.ceilabs.com



Asbestos Report Summary

By: POLARIZING LIGHT MICROSCOPY

PROJECT: Leon Co. Medical Examiner Bldg - Survey; **CEI LAB CODE:** A16-4723
T16-116

METHOD: EPA 600 / R93 / 116 and EPA 600 / M4-82 / 020

Client ID	Layer	Lab ID	Color	Sample Description	ASBESTOS %
1		A2159785	White	Caulk	None Detected
2		A2159786	Gray	Putty	None Detected
3		A2159787	White	Caulk	None Detected
4		A2159788	Black	Sealant	None Detected
5		A2159789	White	Caulk	None Detected
6		A2159790	Gray	Putty	None Detected
7		A2159791	Gray	Putty	None Detected
8		A2159792	Black	Sealant	None Detected
9		A2159793	Gray	Putty	None Detected
10		A2159794	Gray	Putty	None Detected
11		A2159795	Gray,White	Drywall/Joint Compound	None Detected
12		A2159796A	Gray	Baseboard	None Detected
		A2159796B	Cream	Mastic	None Detected
13		A2159797	Gray,White	Drywall/Joint Compound	None Detected
14		A2159798A	Gray	Baseboard	None Detected
		A2159798B	Cream	Mastic	None Detected
15		A2159799A	Gray	Floor Tile	None Detected
		A2159799B	Yellow	Mastic	None Detected
16		A2159800A	Gray	Floor Tile	None Detected
		A2159800B	Yellow	Mastic	None Detected
17		A2159801	Gray,White	Drywall/Joint Compound	None Detected
18		A2159802	Tan	Duct Mastic	None Detected
19		A2159803	Tan	Duct Mastic	None Detected
20		A2159804	Gray	Concrete	None Detected
21		A2159805	Gray	Concrete	None Detected



ASBESTOS BULK ANALYSIS

By: POLARIZING LIGHT MICROSCOPY

Client: Southern Earth Sciences, Inc.
 3642 Peddie Drive
 Tallahassee, FL 32303

CEI Lab Code: A16-4723
Date Received: 05-20-16
Date Analyzed: 05-23-16
Date Reported: 05-23-16

Project: Leon Co. Medical Examiner Bldg - Survey; T16-116

ASBESTOS BULK PLM, EPA 600 METHOD

Client ID Lab ID	Lab Description	Lab Attributes	NON-ASBESTOS COMPONENTS		ASBESTOS %
			Fibrous	Non-Fibrous	
1 A2159785	Caulk	Heterogeneous White Non-fibrous Bound	95% 5%	Caulk Silicates	None Detected
2 A2159786	Putty	Heterogeneous Gray Non-fibrous Bound	100%	Binder	None Detected
3 A2159787	Caulk	Heterogeneous White Non-fibrous Bound	95% 5%	Caulk Silicates	None Detected
4 A2159788	Sealant	Heterogeneous Black Non-fibrous Bound	95% 5%	Binder Silicates	None Detected
5 A2159789	Caulk	Heterogeneous White Non-fibrous Bound	95% 5%	Caulk Silicates	None Detected
6 A2159790	Putty	Heterogeneous Gray Non-fibrous Bound	90% 10%	Binder Silicates	None Detected
7 A2159791	Putty	Heterogeneous Gray Non-fibrous Bound	90% 10%	Binder Silicates	None Detected



ASBESTOS BULK ANALYSIS

By: POLARIZING LIGHT MICROSCOPY

Client: Southern Earth Sciences, Inc.
 3642 Peddie Drive
 Tallahassee, FL 32303

CEI Lab Code: A16-4723
Date Received: 05-20-16
Date Analyzed: 05-23-16
Date Reported: 05-23-16

Project: Leon Co. Medical Examiner Bldg - Survey; T16-116

ASBESTOS BULK PLM, EPA 600 METHOD

Client ID Lab ID	Lab Description	Lab Attributes	NON-ASBESTOS COMPONENTS				ASBESTOS %
			Fibrous		Non-Fibrous		
8 A2159792	Sealant	Heterogeneous Black Non-fibrous Bound	5%	Talc	90%	Binder 5% Silicates	None Detected
9 A2159793	Putty	Heterogeneous Gray Non-fibrous Bound			90%	Binder 10% Silicates	None Detected
10 A2159794	Putty	Heterogeneous Gray Non-fibrous Bound			90%	Binder 10% Silicates	None Detected
11 A2159795	Drywall/Joint Compound	Heterogeneous Gray,White Non-fibrous Bound	15%	Cellulose	5%	Paint 15% Calc Carb 65% Gypsum	None Detected
12 A2159796A	Baseboard	Heterogeneous Gray Non-fibrous Bound			100%	Vinyl	None Detected
A2159796B	Mastic	Heterogeneous Cream Non-fibrous Bound			95%	Mastic 5% Calc Carb	None Detected
13 A2159797	Drywall/Joint Compound	Heterogeneous Gray,White Non-fibrous Bound	15%	Cellulose	5%	Paint 15% Calc Carb 65% Gypsum	None Detected



ASBESTOS BULK ANALYSIS

By: POLARIZING LIGHT MICROSCOPY

Client: Southern Earth Sciences, Inc.
3642 Peddie Drive
Tallahassee, FL 32303

CEI Lab Code: A16-4723
Date Received: 05-20-16
Date Analyzed: 05-23-16
Date Reported: 05-23-16

Project: Leon Co. Medical Examiner Bldg - Survey; T16-116

ASBESTOS BULK PLM, EPA 600 METHOD

Client ID Lab ID	Lab Description	Lab Attributes	NON-ASBESTOS COMPONENTS		ASBESTOS %
			Fibrous	Non-Fibrous	
14 A2159798A	Baseboard	Heterogeneous Gray Non-fibrous Bound	100%	Vinyl	None Detected
A2159798B	Mastic	Heterogeneous Cream Non-fibrous Bound	100%	Mastic	None Detected
15 A2159799A	Floor Tile	Heterogeneous Gray Non-fibrous Bound	85% 15%	Vinyl Silicates	None Detected
A2159799B	Mastic	Heterogeneous Yellow Non-fibrous Bound	100%	Mastic	None Detected
16 A2159800A	Floor Tile	Heterogeneous Gray Non-fibrous Bound	85% 15%	Vinyl Silicates	None Detected
A2159800B	Mastic	Heterogeneous Yellow Non-fibrous Bound	100%	Mastic	None Detected
17 A2159801	Drywall/Joint Compound	Heterogeneous Gray, White Non-fibrous Bound	15%	Cellulose 5% Silicates 15% Calc Carb 65% Gypsum	None Detected



ASBESTOS BULK ANALYSIS

By: POLARIZING LIGHT MICROSCOPY

Client: Southern Earth Sciences, Inc.
 3642 Peddie Drive
 Tallahassee, FL 32303

CEI Lab Code: A16-4723
Date Received: 05-20-16
Date Analyzed: 05-23-16
Date Reported: 05-23-16

Project: Leon Co. Medical Examiner Bldg - Survey; T16-116

ASBESTOS BULK PLM, EPA 600 METHOD

Client ID Lab ID	Lab Description	Lab Attributes	NON-ASBESTOS COMPONENTS		ASBESTOS %
			Fibrous	Non-Fibrous	
18 A2159802	Duct Mastic	Heterogeneous Tan Non-fibrous Bound	95% 5%	Mastic Silicates	None Detected
19 A2159803	Duct Mastic	Heterogeneous Tan Non-fibrous Bound	95% 5%	Mastic Silicates	None Detected
20 A2159804	Concrete	Heterogeneous Gray Non-fibrous Bound	30% 70%	Binder Silicates	None Detected
21 A2159805	Concrete	Heterogeneous Gray Non-fibrous Bound	30% 70%	Binder Silicates	None Detected



LEGEND: Non-Anth = Non-Asbestiform Anthophyllite
Non-Trem = Non-Asbestiform Tremolite
Calc Carb = Calcium Carbonate

METHOD: EPA 600 / R93 / 116 and EPA 600 / M4-82 / 020

LIMIT OF DETECTION: <1% by visual estimation

REGULATORY LIMIT: >1% by weight

Due to the limitations of the EPA 600 method, nonfriable organically bound materials (NOBs) such as vinyl floor tiles can be difficult to analyze via polarized light microscopy (PLM). EPA recommends that all NOBs analyzed by PLM, and found not to contain asbestos, be further analyzed by Transmission Electron Microscopy (TEM). Please note that PLM analysis of dust and soil samples for asbestos is not covered under NVLAP accreditation.

This report relates only to the samples tested or analyzed and may not be reproduced, except in full, without written approval by CEI Labs, Inc. CEI Labs makes no warranty representation regarding the accuracy of client submitted information in preparing and presenting analytical results. Interpretation of the analytical results is the sole responsibility of the client. This report may not be used by the client to claim product endorsement by NVLAP or any other agency of the U.S. Government.

ANALYST: Candace Burrus
Candace Burrus

APPROVED BY: Tianbao Bai
Tianbao Bai, Ph.D., CIH
Laboratory Director





107 New Edition Court, Cary, NC 27511
 Tel: 866-481-1412; Fax: 919-481-1442

(21) A16-4723
 A2159785-
 A2159805

**ASBESTOS
 CHAIN OF CUSTODY**

LAB USE ONLY:
CEI Lab Code:
CEI Lab I.D. Range:

COMPANY INFORMATION	PROJECT INFORMATION
CEI CLIENT #: 3019	Job Contact: Roy L. Russell
Company: Southern Earth Sciences, Inc.	Email / Tel: cell 850-519-1565 (for questions)
Address: 3642 Peddie Drive	Project Name: Leon Co. Medical Examiner Bldg Survey
Tallahassee, FL 32303	Project ID# T16-116
Email: russell@soearth.com; ljackson@soearth.com	PO #:
Tel: 850-576-4652 Fax: 850-576-4710	STATE SAMPLES COLLECTED IN: Florida

GENERAL INSTRUCTIONS		
POSITIVE STOP ANALYSIS	<input type="checkbox"/>	PLM DUE DATE: / /
ANALYZE NOB'S BY TEM	<input type="checkbox"/>	TEM DUE DATE: / /

IF TAT IS NOT MARKED STANDARD 3 DAY TAT APPLIES.

ASBESTOS	METHOD	TURN AROUND TIME					
		4 HR	8 HR	24 HR	2 DAY	3 DAY	5 DAY
PLM BULK	EPA 600	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
PLM POINT COUNT (400)	EPA 600	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
PLM POINT COUNT (1000)	EPA 600	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
PLM GRAV w POINT COUNT	EPA 600	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
PCM AIR	NIOSH 7400	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
TEM AIR AHERA	EPA AHERA	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
TEM AIR NIOSH	NIOSH 7402	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
TEM BULK	CHATFIELD	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
TEM DUST WIPE	ASTM D6480-05	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
TEM DUST MICROVAC	ASTM D5755-09	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
TEM SOIL	ASTM D7521-13	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
TEM VERMICULITE	CINCINNATI METHOD	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
OTHER:		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

REMARKS:		<input checked="" type="checkbox"/> Accept Samples <input type="checkbox"/> Reject Samples	
Relinquished By:	Date/Time	Received By:	Date/Time
<i>R. L. Russell</i>	05/19/16 1600	MR	5/20/16 8:55

Samples will be disposed of 30 days after analysis

AK-4723



SAMPLING FORM

COMPANY CONTACT INFORMATION	
Company: Southern Earth Sciences Inc.	Job Contact: Roy L. Russell
Project Name: Leon Co. Medical Examiner Bldg Survey	Tallahassee, FL Office
Project ID #: T76-116	Tel: 850-576-4652

SAMPLE ID#	DESCRIPTION / LOCATION	VOLUME/AREA	COMMENTS
1	Roof Vent Base		
2	Roof Vent Pipe		White Caulk
3	Roof Skylight Base		Gray Putty
4	Roof Skylight Base		White Caulk
5	Roof Vent Pipe		Black Sealant
6	Roof Seams		White Caulk
7	Roof Seams		Gray Putty
8	Skylight Base Roof		Gray Putty
9	Ext Door Casings		Black Sealant
10	Ext Door Casings		Gray Putty
11	Women's RR Wall		Gray Putty
12	" " "		DW/SC Composite
13	Men's RR Wall		Gray VBD
14	" " "		DW/SC Composite
15	South Center Entry Floor		Gray VBD
16	RR Foyer Floor		12" Gray VFT
17	Upper Wall above RRs		12" Gray VFT
18	Metal Duct above RAs		DW/SC Composite
19	" " " "		Tan Duct Mastic
20	Warehouse Slab		Tan Duct Mastic
21	Ramp		Concrete Concrete

CERTIFICATIONS

Professional Regulation. Our professionals and businesses range from architects to yacht brokers, from boxers to barbeque restaurants, and they keep Florida's economy strong.

Every day we work to improve the way we do business in order to serve you better. For information about our services, please log onto www.myfloridalicense.com. There you can find more information about our divisions and the regulations that impact you, subscribe to department newsletters and learn more about the Department's initiatives.

Our mission at the Department is: License Efficiently, Regulate Fairly. We constantly strive to serve you better so that you can serve your customers. Thank you for doing business in Florida, and congratulations on your new license!



STATE OF FLORIDA
DEPARTMENT OF BUSINESS AND
PROFESSIONAL REGULATION

AX85

ISSUED: 12/07/2014

ASBESTOS CONSULTANT
WILSON, MARK E
SOUTHERN EARTH SCIENCES INC

IS LICENSED under the provisions of Ch.469 FS.
Expiration date NOV 30, 2016 L1412070001732

DETACH HERE

RICK SCOTT, GOVERNOR

KEN LAWSON, SECRETARY

STATE OF FLORIDA
DEPARTMENT OF BUSINESS AND PROFESSIONAL REGULATION
ASBESTOS LICENSING UNIT

LICENSE NUMBER	
AX85	

The ASBESTOS CONSULTANT
Named below IS LICENSED
Under the provisions of Chapter 469 FS.
Expiration date: NOV 30, 2016



WILSON, MARK E
SOUTHERN EARTH SCIENCES INC
3642 PEDDIE DRIVE
TALLAHASSEE FL 32303



ISSUED: 12/07/2014

DISPLAY AS REQUIRED BY LAW

SEQ # L1412070001732

RICK SCOTT, GOVERNOR

KEN LAWSON, SECRETARY

STATE OF FLORIDA
DEPARTMENT OF BUSINESS AND PROFESSIONAL REGULATION
ASBESTOS LICENSING UNIT

LICENSE NUMBER	
ZA0000092	

The ASBESTOS BUSINESS ORGANIZATION
Named below IS LICENSED
Under the provisions of Chapter 469 FS.
Expiration date: NOV 30, 2017



SOUTHERN EARTH SCIENCES INC
MICHAEL K. VARNER
7500-A MCELVEY ROAD
PANAMA CITY BEACH FL 32408



ISSUED: 09/13/2015

DISPLAY AS REQUIRED BY LAW

SEQ # L1509130003037

UF | TREEO Center UNIVERSITY of FLORIDA

Center for Training, Research and Education for Environmental Occupations

certifies

Roy L. Russell

Southern Earth Sciences Inc., 3642 Peddie Dr., Tallahassee, FL 32303

Having passed a 25-question exam with a score of 70% or higher has successfully met training requirements for

Asbestos Refresher: Inspector

FDBPR Asbestos Licensing Unit: Provider #0000995; Course #FL49-0004731 (1/2 Day; 3.40 Contact Hours)
(**Reaccreditation for Inspector under TSCA Title II/AHERA**)

Conducted

08/04/2015

Certificate #: 160042-5233

Exam Date: 08/04/2015

EPA accreditation expires: 08/04/2016

Principal Instructor: Brian Duchene, PE, LAC

CEUs: .4

FBPR LAC: #0000995; Course #0004731

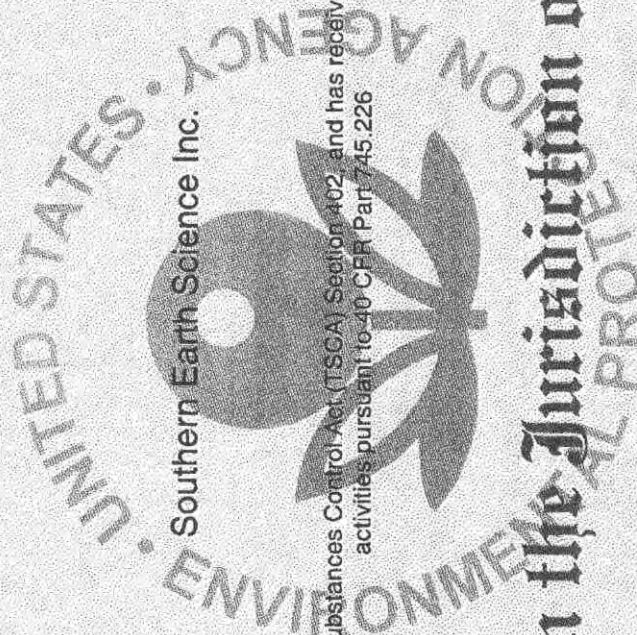
FBPE PDHs: #0004021; Course #0009083/Educational Institutions: 4 PDHs



Carol Hinton, Associate Director

United States Environmental Protection Agency

This is to certify that



Southern Earth Science Inc.

has fulfilled the requirements of the Toxic Substances Control Act (TSCA) Section 402, and has received certification to conduct lead-based paint activities pursuant to 40 CFR Part 745.226

In the Jurisdiction of:

Florida

This certification is valid from the date of issuance and expires

August 09, 2016

FL-15608-3

Certification #

August 07, 2013

Issued On

Michelle Price, Chief

Lead, Heavy Metals, and Inorganics Branch



United States Environmental Protection Agency

This is to certify that

Roy L. Russell

has fulfilled the requirements of the Toxic Substances Control Act (TSCA) Section 402, and has received certification to conduct lead-based paint activities pursuant to 40 CFR Part 745.226 as a:

Inspector

In the Jurisdiction of:

Florida

This certification is valid from the date of issuance and expires May 13, 2017

FL-I-5950-5

Certification #

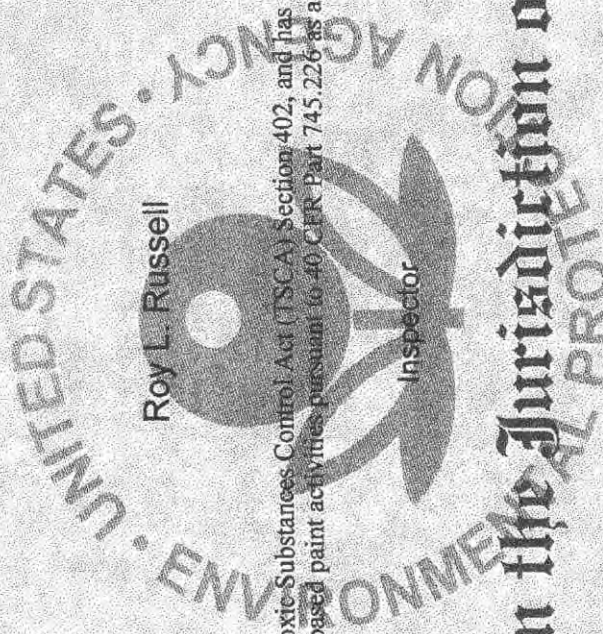
APRIL 29, 2014

Issued On



Adrienne Priselac, Manager, Toxics Office

Communities and Ecosystems Division



SECTION 024119 - SELECTIVE DEMOLITION

PART 1 - GENERAL

1.01 SUMMARY

- A. This Section requires the selective removal and subsequent offsite disposal of, but not necessarily limited to the following:
1. Portions of site sidewalks.
 2. Portions of interior partitions and finishes.
 3. Portions of concrete slabs and CMU walls.
 4. Portions of metal roof and fascia panels.
 5. Portions of existing doors, frames and associated hardware.
 6. Portions of existing electric, mechanical, and plumbing systems.
 7. All of existing interior ceiling system.

NOTE: Plans and specifications indicate general locations where demolition is required, but is not intended to show all possible items or areas of demolition. All demolition required to complete work is in contract.

- B. Related work

Relocation of pipes, and other mechanical and electrical work is specified in other Divisions.

1.02 SUBMITTALS

- A. Schedule indicating proposed sequence of operations for selective demolition work to Owner's Representative for review prior to start of work. Include coordination for shutoff, capping, and continuation of utility services as required, together with details for dust and noise control protection.
1. Provide detailed sequence of demolition and removal work to ensure uninterrupted progress of Owner's on-site operations.
 2. Coordinate with Owner's continuing occupation of existing buildings and with Owner's.
- B. Photographs of existing conditions of structure surfaces, equipment, and adjacent improvements that might be misconstrued as damage related to removal operations. File with Owner prior to start of work.

1.03 JOB CONDITIONS

- A. Occupancy: The designated project area will be vacated. The Owner will occupy buildings immediately adjacent to the areas being renovated. Conduct selective demolition work in manner that will minimize need for disruption of Owner's normal operations. Provide minimum of 72 hours advance notice to Owner of demolition activities that will affect Owner's normal operations.
- B. Condition of Structures: Owner assumes no responsibility for actual condition of items or structures to be demolished. Conditions existing at time of inspection for bidding purposes will be maintained by Owner insofar as practicable. However, minor variations within structure may

SECTION 024119 - SELECTIVE DEMOLITION (continued):

occur by Owner's removal and salvage operations prior to start of selective demolition work.

- C. Protections: Provide temporary barricades and other forms of protection to protect Owner's personnel and general public from injury due to selective demolition work.
1. Provide protective measures as required to provide free and safe passage of Owner's personnel and general public to occupied portions of building.
 2. Erect temporary covered passageways as required by authorities having jurisdiction.
 3. Remove protections at completion of work.
- Maintain fire egress / exits.
- D. Damages: Promptly repair damages caused to adjacent facilities by demolition work.
- E. Traffic: Conduct selective demolition operations and debris removal to ensure minimum interference with roads, streets, walks, and other adjacent occupied or used facilities.
1. Do not close, block, or otherwise obstruct streets, walks, or other occupied or used facilities without written permission from authorities having jurisdiction. Provide alternate routes around closed or obstructed traffic ways if required by governing regulations.
- F. Flame Cutting: Do not use cutting torches for removal until work area is cleared of flammable materials. At concealed spaces, such as interior of ducts and pipe spaces, verify condition of hidden space before starting flame-cutting operations. Maintain portable fire suppression devices during flame-cutting operations.
- G. Utility Services: Maintain existing utilities indicated to remain in service and protect them against damage during demolition operations.
1. Do not interrupt utilities serving occupied or used facilities, except when authorized in writing by authorities having jurisdiction. Provide temporary services during interruptions to existing utilities, as acceptable to governing authorities.
 2. **Maintain fire protection services during selective demolition operations.**
- H. Environmental Controls: Use water sprinkling, temporary enclosures, and other methods to limit dust and dirt migration. Comply with governing regulations pertaining to environmental protection.
1. Do not use water when it may create hazardous or objectionable conditions such as ice, flooding, and pollution.

PART 2 - PRODUCTS (Not Applicable)

PART 3 - EXECUTION

3.01 PREPARATION

- A. Locate, identify, stub off, and disconnect utility services that are not indicated to remain.

SECTION 024119 - SELECTIVE DEMOLITION (continued):

1. Provide bypass connections as necessary to maintain continuity of service to occupied areas of building. Provide minimum of 72 hours advance notice to Owner if shutdown of service is necessary during changeover.

3.02 DEMOLITION

- A. Perform selective demolition work in a systematic manner. Use such methods as required to complete work indicated on Drawings in accordance with demolition schedule and governing regulations.
 1. Cut concrete and asphalt at junctures with construction to remain using power-driven masonry saw or hand tools; do not use power-driven impact tools.
 2. Completely fill below-grade areas and voids resulting from demolition work. Provide fill consisting of approved earth, gravel, or sand, free of trash and debris, stones over 6 inches in diameter, roots, or other organic matter.
- B. If unanticipated mechanical, electrical, or structural elements that conflict with intended function or design are encountered, investigate and measure both nature and extent of the conflict. Submit report to Owner's Representative in written, accurate detail. Pending receipt of directive from Owner, rearrange selective demolition schedule as necessary to continue overall job progress without undue delay.

3.03 SALVAGED MATERIALS

- A. Salvaged Items: Where indicated on Drawings as "Salvage - Deliver to Owner," carefully remove indicated items, clean, store, and turn over to Owner and obtain receipt.
- B. Historic artifacts, including cornerstones and their contents, commemorative plaques and tablets, antiques, and other articles of historic significance, remain property of Owner. Notify Owner if such items are encountered and obtain acceptance regarding method of removal and salvage for Owner.

3.04 DISPOSAL OF DEMOLISHED MATERIALS

- A. Remove from building site debris, rubbish, and other materials resulting from demolition operations. Transport and legally dispose off site.
 1. If hazardous materials are encountered during demolition operations **notify the Architect and Owner**. Comply with applicable regulations, laws, and ordinances concerning removal, handling, and protection against exposure or environmental pollution.

Note: Contractor shall comply with the notice requirements of Chapter 62-257.301, F.A.C., Asbestos Program when renovation or demolition of site or facility involving the removal of a threshold amount of regulated ACM (asbestos containing material) regardless of whether or not asbestos is present. "Notice of Asbestos Renovation or Demolition", DEP Form Number 62-257.900(1), effective 2-9-99 shall be filed with FDEP (Florida Department of Environmental Protection) ten (10) working days prior to commencement of work.
 2. Burning of removed materials is not permitted on project site.

SECTION 024119 - SELECTIVE DEMOLITION (continued):

3.05 CLEANUP AND REPAIR

- A. General: Upon completion of demolition work, remove tools, equipment, and demolished materials from site. Remove protections and leave interior areas broom clean.
- B. Repair demolition performed in excess of that required. Return elements of construction and surfaces to remain to condition existing prior to start operations. Repair adjacent construction or surfaces soiled or damaged by selective demolition work.

END OF SECTION 024119

SECTION 030510 - CONCRETE MOISTURE REDUCTION ADMIXTURE

PART 1 – GENERAL

1.01 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including Contractual Conditions and Division 01 Specification Sections, apply to this Section.

1.02 SUMMARY

- A. Section Includes: Barrier-1 High Performance Concrete Admixture to be provided at all concrete slabs on grade to receive finished flooring.

1.03 REFERENCES

- A. American Society for Testing and Materials International (ASTM)
 - 1. ASTM C 157: Standard Test Method for Length Change For Hardened Hydraulic-Cement Mortar and Concrete
 - 2. ASTM D 5084: Standard Test Methods for Measurement of Hydraulic Conductivity of Saturated Porous Materials Using a Flexible Wall Permeameter
 - 3. ASTM E 96: Standard Test Method for Water Vapor Transmission of Materials
 - 4. ASTM E 1643 Standard Practice for Selection, Design, Installation, and Inspection of Water Vapor Retarders Used in Contact with Earth or Granular Fill Under Concrete Slabs
 - 5. ASTM E 1745 Standard Specification for Water Vapor Retarders Used in Contact with Soil or Granular Fill under Concrete Slabs
 - 6. ASTM F 710-11 Standard Practice for Preparing Concrete Floors to Receive Resilient Flooring
 - 7. ASTM C 494/C 494M-08a Chemical Admixtures For Concrete Type S

1.04 SUBMITTALS

- A. Product Data: Manufacturer's printed data sheets.
 - 1. Include standard slab repair details.
 - 2. Include vapor barrier data showing compliance with this section
- B. Product test reports performed by a qualified independent testing agency evidencing compliance of products with specified requirements of water-vapor transmission based on comprehensive testing of current products.
- C. Manufacturer's certificate certifying admixture provided meets or exceeds specified requirements.
- D. Sample warranty.

1.05 QUALITY ASSURANCE

- A. Single Source Responsibility: Single source product from one manufacturer.
- B. Toxicity/Hazardous Materials: Provide products that contain no urea-formaldehyde.
- C. Repairs to slabs must be in accordance with concrete industry standards and meeting waterproofing

SECTION 030510 – CONCRETE MOISTURE REDUCTION ADMIXTURE (continued):

admixture manufacturer's published details.

1.06 DELIVERY, STORAGE, AND HANDLING

- A. Comply with manufacturers written instructions for handling prior to adding to concrete batch.
- B. Store protected from exposure to harmful weather conditions and in a temperature controlled area above 36 deg F. Do not allow product to freeze.

1.07 WARRANTY

- A. Project Warranty: Refer to Conditions of the Contract for project warranty provisions.
- B. Provide manufacturer's standard warranty documents executed by an authorized company official. Manufacturer's warranty is in addition to, and not a limitation of, other rights the owner may have under provisions of the Contract Documents.
 - 1. Warranty Period: Ten years commencing on the Date of Substantial Completion.
 - 2. Warranty Terms: Terms to include moisture related failures, including removal of existing flooring, moisture remediation of the concrete substrate, all finish floor materials and labor.
 - 3. Warranty Basis: Follow Quality Control Protocol 3.1.D achieving a maximum coefficient of permeability of E-08 cm/sec on all project test samples.

PART 2 - PRODUCTS

2.01 MANUFACTURERS

- A. Concrete moisture vapor reduction admixture for interior slab construction shall be Barrier One, Inc., 522 S. Hunt Club Blvd.,#303, Apopka, Florida 32703. Contact Manufacturer's representative: 877.224.5850, Fax: 866.594.3490. Email: info@barrier-1.com
 - 1. Other manufacturers may be acceptable when meeting the specified warranty requirements (Part 01 – General), the field quality control testing requirements (Part 3 – Execution), and have a documented remediation process in the event of a failure.

2.02 MATERIALS

- A. Product Description: Concrete moisture vapor reduction admixture is to be free of all volatile organic compounds (VOC). It is designed to have a natural chemical reaction with pre-existing elements inside the concrete to eliminate the route of moisture vapor emission through concrete by closing down the integral capillary system. The chemical reaction forms a permanent barrier (capillary break) which is integral to the concrete and irremovable.
 - 1. Water Vapor Transmission: E-08 cm/sec per ASTM D 5084
 - 2. Appearance: Colorless
 - 3. Odor: None
 - 4. Toxicity: None
 - 5. Flammability: None
 - 6. Ph: 11.3
 - 7. Shelf Life: Indefinite

SECTION 030510 – CONCRETE MOISTURE REDUCTION ADMIXTURE (continued):

8. Weight: 11.2 lbs per gallon
9. Freeze Temp: 32°F
10. Storage Temp: Above 36°F
11. Solvent: Water
12. Acid Resistance: Excellent
13. Hazardous Vapors: None
14. Capillary Break: Calcium Silicate Hydrate Gel
15. Installation: All concrete
16. VOC Levels: Zero

- B. The admixture is to contain an anti-microbial biocide to inhibit mold and bacteria growth.

2.03 RELATED MATERIALS

- A. Sheet Vapor Retarder: ASTM E 1745-09 vapor retarder maintaining a permeance of 0.1 US perms (grains/ft²*hr*inHg) or less after the required product conditioning specified in ASTM E 1745-09 Include manufacturer's recommended adhesive or pressure-sensitive tape.
1. Products: Any sheet vapor barrier that can show compliance with required perm rating after product conditioning specified in ASTM E 1745-09. Final approval is with Barrier-

PART 3 - EXECUTION

3.01 APPLICATION

- A. Install vapor barrier following ASTM E 1643-98(2005) guidelines.
- B. Placement of the vapor retarder shall be in accordance with ASTM F 710-11 Section 4, Paragraph 4.1.
- C. Moisture Vapor Reduction Admixture: Add Admixture in accordance with manufacturer's recommendations to all ready mix concrete to be placed in interior slab-on-ground, interior elevated slab construction, structural roof decks, vertical cast in place, precast and tilt wall at the batch plant or at the job site.
- D. A representative or agent of must be present at the jobsite during the placement of all treated concrete. Do not proceed without the representative or agent being present for the certification of the mix and placement process. Provide minimum 10 days notice of the placement of the treated concrete.
- E. The Quality Control Protocol shall consist of the Admixture representative procuring random cylinder(s) from every placement of concrete containing the Admixture. These cylinder(s) will be sent to an independent laboratory for hydraulic conductivity (coefficient of permeability) testing per ASTM D5084. The results of this "project specific" quality control protocol forms the basis for the issuance of the project specific warranty.
- F. Dispense admixture per manufacturer's recommendation or at a rate of 14 oz. per 100 lbs. of cementitious materials at the tail end of the load, dose to be within plus or minus 3 percent. Additional dosage may be required based on the mix design.
1. Add Admixture to ready mix concrete truck, in the require dosage, and mix for 7 (seven)

SECTION 030510 – CONCRETE MOISTURE REDUCTION ADMIXTURE (continued):

- minutes before discharge. Admixture is to be used in lieu of designed mix water, not in addition to mix water.
2. A water-to-cementitious material ratio (w/cm) of 0.42 to 0.52 is critical and it is imperative to comply with the mix design
 3. The addition of non-chlorinated admixtures is permitted.
 4. The addition of Shrink Reducing Admixtures is **not** permitted.
- G. Other admixtures may be used in the same concrete batch with Barrier-I provided that such admixtures are added separately.
1. Use of plasticizers or water reducers is recommended to achieve slumps greater than 4 inches.

3.02 CURING

- A. The concrete is to be cured for a minimum of 24 hours after finishing operations are complete by placing minimum 2mil polyethylene plastic on the concrete slab. The use of curing compounds and/or following ACI 302.2R guidelines are acceptable and have no deleterious effects on dosed slabs.

3.03 FIELD QUALITY CONTROL

- A. Testing of slabs containing Admixture will be carried out to include, but not limited to: random 4 inch cylinder(s) **or** drilled sample core(s) on all project slabs. Sample(s) will be taken from every concrete placement on every project. The sample(s) will be sent to an independent laboratory and tested for permeability. Results are for the purpose of internal quality control of manufacturer. The warranty will be issued, upon request, to the Construction Manager within 30 days of final concrete placement and no other testing is required for the installation of floor coverings.

3.04 REPAIRS

- A. Make repairs to slab in accordance with other Division 03 sections and as shown in manufacturer's published details and remediation program.

END OF SECTION 030510

SECTION 033000 - BUILDING CONCRETE WORK

PART 1 - GENERAL

1.01 QUALITY ASSURANCE

- A. Codes and Standards: Comply with provisions of following codes, specifications and standards, except where more stringent requirements are shown or specified:

ACI 301 "Specifications for Structural Concrete for Buildings."

ACI 318 "Building Code Requirements for Reinforced Concrete."

ACI 347 "Recommended Practice for Concrete Formwork."

Concrete Reinforcing Steel Institute, "Manual of Standard Practice."

- 1.02 SUBMITTALS: Submit manufacturer's product data with installation instructions for proprietary materials including reinforcement and forming accessories, admixtures, joint materials, hardeners, curing materials and others as requested by Architect.

- A. Submit design mixes of each individual type of concrete to be used on the project prior to the start of concrete work. Tests shall be made for compressive strength, slump and air entrainment. Proportion mixes in compliance with mix design procedures specified in ACI 301 and requirements stated on the plans.
- B. Submit shop drawings for fabrication, bending, and placement of concrete reinforcement. Comply with ACI 315 "Manual of Standard Practice for Detailing Reinforced Concrete Structures" showing bar schedules, stirrup spacing, diagrams of bent bars, and arrangement of concrete reinforcement. Include special reinforcement required for openings through concrete structures.
- C. Concrete Testing Service: The Contractor shall employ, at his sole expense, an independent testing agency acceptable to the Architect/Engineer to perform sampling and testing during concrete placement as follows. Refer to Section 01400 for additional requirements for Testing Agency.
1. Sampling: ASTM C 172.
 2. Slump: ASTM C 143, one test for each load at **point of discharge**.
 3. Air Content: ASTM C 173, one for each set of compressive strength specimens.
 4. Compressive Strength: ASTM C 39, three sets for each 50 cu. yds. or fraction thereof of each class of concrete; one specimen tested at 7 days, two specimens tested at 28 days, and one retained for later testing if required. When the total quantity of a given class of concrete is less than 50 cu. yds., strength tests may be waived by Architect if field experience indicates evidence of satisfactory strength.
 5. Test Results will be reported in writing to Architect, Contractor, and concrete producer within 24 hours after tests are made.

PART 2 - PRODUCTS

2.01 FORM MATERIALS

- A. Forms for Exposed Finish Concrete: Unless otherwise indicated, construct formwork for exposed concrete surfaces with plywood, metal, metal-framed plywood faced or other acceptable panel-type materials, to provide continuous, straight, smooth, exposed surfaces. Furnish in largest practicable sizes to minimize number of joints and to conform to joint system shown on drawings. Provide

SECTION 033000 - BUILDING CONCRETE WORK (continued):

form material with sufficient thickness to withstand pressure of newly-placed concrete without bow or deflection.

- I. Use plywood complying with U.S. Product Standard PS-1 "B-B (Concrete Form) Plywood," Class I, Exterior Grade or better, mill-oiled and edge-sealed, with each piece bearing legible inspection trademark.
- B. Forms for Unexposed Finish Concrete: Form concrete surfaces which will be unexposed in finished structure with plywood, lumber, metal or other acceptable material. Provide lumber dressed on at least 2 edges and one side for tight fit.
- C. Cylindrical Columns and Supports: Form round-section members with metal, fiberglass reinforced plastic, or paper or fiber tubes. Construct paper or fiber tubes of laminated plies using water-resistant adhesive with wax-impregnated exterior for weather and moisture protection. Provide units with sufficient wall thickness to resist loads imposed by wet concrete without deformation.
- D. Form Coatings: Provide commercial formulation form-coating compounds that will not bond with, stain nor adversely affect concrete surfaces, and will not impair subsequent treatments of concrete surfaces.

2.02 REINFORCING MATERIALS

- A. Reinforcing Bars: ASTM A 615, Grade 60, deformed.
- B. Supports for Reinforcement: Provide supports for reinforcement including bolsters, chairs, spacers and other devices for spacing, supporting and fastening reinforcing bars and welded wire fabric in place. Use wire bar type supports complying with CRSI specifications, unless otherwise acceptable.

2.03 CONCRETE MATERIALS

- A. Portland Cement: ASTM C 150, Type I, unless otherwise acceptable to Architect.

Use one brand of cement throughout project, unless otherwise acceptable to Architect.

- B. Normal Weight Aggregates: ASTM C 33, and as herein specified. Provide aggregates from a single source for exposed concrete.
 1. Local aggregates not complying with ASTM C 33 but which have shown by special test or actual service to produce concrete of adequate strength and durability may be used when acceptable to Architect.
 2. The aggregate shall not exceed 1" in its maximum dimensions for foundation and slab work nor 3/8" (pea gravel) for concrete block lintels and filled cells.
 3. Lightweight Aggregates: ASTM C 330.
 4. Water: Drinkable.
 5. Air-Entraining Admixture: ASTM C 260.
 - a. Available Products: Subject to compliance with requirements, products which may be incorporated in the work include, but are not limited to the following:

"Sika Aer"; Sika Corp
"MB-VR or MB-AE"; Master Builders
"Dorex AEA"; W.R. Grace
"Edoco 2001 or 2002"; Edoco Technical Product

- 2.04 RELATED MATERIALS: Submit any product not specifically listed in this specification to Architect for approval.

SECTION 033000 - BUILDING CONCRETE WORK (continued):

- A. Vapor Barrier: Provide vapor barrier cover over prepared base material where indicated. Comply with the following:
1. Permeance Rating Per ASTM E 96 or ASTM F 1249. Must meet permeance requirements for both new material and after ASTM E-1745 mandatory conditioning test (ASTM E 1745, Section 7.1.2, 7.1.3, 7.1.4, and 7.1.5):
 - a. New material: Less than 0.01 perms (gr/ft²/hr/in-Hg)
 - b. After conditioning: Less than 0.01 perms (gr/ft²/hr/in-Hg)
 2. Water Vapor Barrier ASTM E 1745; Meets or exceeds Class A.
 3. Water Vapor Barrier Not less than 15 mils thick.
 4. Woven materials not acceptable.
 5. Basis of Design: Stego Wrap 15 mil Vapor Barrier by Stego Industries LLC OR approved equal.
 6. Seam tape and vapor proofing mastic shall be material recommended by manufacturer.
- B. Non-Shrink Grout: CRD-C 621, factory pre-mixed grout.
1. Available Products: Subject to compliance with requirements, products which may be incorporated in the work include, but are not limited to, the following:
 - a. Non-metallic

"Masterflow 713"; Master Builders
"Euco-NS"; Euclid Chemical Co.
- C. Liquid Membrane Forming Curing Compound: Liquid type membrane-forming curing compound complying with ASTM C 309, Type I, Class A unless other type acceptable to Architect. Moisture loss not more than 0.055 gr./sp. cm. when applied at 200 sq. ft./gal.
1. Available Products: Subject to compliance with requirements, products which may be incorporated in the work include, but are not limited to, the following:

"Masterseal"; Master Builders
"Ecocure"; Euclid Chemical Co.
"Clear Seal"; A. C. Horn
"Kure-N-Seal"; Sonneborn-Contech
- D. Cure, Sealer and Dustproofers: ASTM C-309, containing 250% solids. A Day-Chem Cure & Seal@ (J-22) by Dayton Superior OR approved equal. Surface shall have a high gloss finish.

2.05 PROPORTIONING AND DESIGN OF MIXES

- A. Prepare design mix for each type and strength of concrete by either laboratory trial batch or field experience methods as specified in ACI 301. If trial batch method is used, use an independent testing facility acceptable to Architect for preparing and reporting proposed mix designs. The testing facility shall not be the same as used for field quality control testing unless otherwise acceptable to Architect.
- B. Submit written reports to Architect of each proposed mix for each class of concrete at least 15 days prior to start of work. Do not begin concrete production until mixes have been reviewed by Architect.

SECTION 033000 - BUILDING CONCRETE WORK (continued):

- C. Design mixes to yield normal weight concrete with the following properties, as indicated on drawings and schedules:

Concrete in slabs and footings shall have a minimum compressive strength of 3,000 psi except concrete in drive thru slabs shall have a minimum compressive strength of 4,000 psi and in beams and columns a minimum compressive strength of 4000 psi at 28-days; the maximum W/C ratio shall be 0.46 maximum (air-entrained).

MAXIMUM WATER CONTENT SHALL NOT EXCEED 230# / C.Y. AND RETEMPERING OR ADDING WATER AT THE JOBSITE IS PROHIBITED.

- D. Adjustment to Concrete Mixes: Mix design adjustments may be requested by Contractor when characteristics of materials, job conditions, weather, test results, or other circumstances warrant; at no additional cost to Owner and as accepted by Architect. Laboratory test data for revised mix design and strength results must be submitted to and accepted by Architect before using in work.

- E. Admixtures: Use air-entraining admixture in exterior exposed concrete, unless otherwise indicated. Add air-entraining admixture at manufacturer's prescribed rate to result in concrete at point of placement having total air content with a tolerance of plus-or-minus 1-1/2% within following limits:

Concrete structures and slabs exposed to freezing and thawing, deicer chemicals, or subjected to hydraulic pressure:

4.5% (moderate exposure); 5.5% (severe exposure) 1-1/2" max. aggregate.
5.0% (moderate exposure); 6.0% (severe exposure) 3/4" max. aggregate.

Other Concrete: 2% to 4% air.

- F. Slump Limits: Proportion and design mixes to result in concrete slump at point of placement as follows:

Ramps, slabs, and sloping surfaces: Not more than 3".

Reinforced foundation systems: Not less than 1" and not more than 3".

Pea gravel pump mix for filled masonry cells (3000 psi) 4 to 8".

Other concrete: Not more than 4", except when slump is increased by use of super plasticizers.

2.06 CONCRETE MIXES

- A. Ready-Mix Concrete: Comply with requirements of ASTM C 94, and as herein specified.

During hot weather, or under conditions contributing to rapid setting of concrete, a shorter mixing time than specified in ASTM C 94 may be required.

When air temperature is between 85°F (30°C) and 90°F (32°C), reduce mixing and delivery time from 1-1/2 hours to 75 minutes, and when air temperature is above 90°F (32°C), reduce mixing and delivery time to 60 minutes.

Exposed concrete slab concrete shall not be pumped unless it contains super plasticizers, and "Recover" admixture as manufactured by W.R.Grace Co.

SECTION 033000 - BUILDING CONCRETE WORK (continued):

2.07 CONCRETE TOPPING

- A. Provide Level-Right Self-Leveling Floor Underlayment by Maxxon Corporation in locations indicated on drawings. Comply with manufacturer's requirements and the following:
- | | | |
|----|---------------------------------------|--|
| 1. | <u>Compressive Strengths:</u> | Modified ASTM C 109; up to 3000 psi (3 day). |
| 2. | <u>Tensile Strength:</u> | ASTM C 190; 720 psi (28 day). |
| 3. | <u>Surface Buring Characteristic:</u> | Flame Spread - 0.
Fuel Contribution - 0.
Smoke Development - 0. (ASTM E 84). |
| 4. | <u>Fire Ratings:</u> | U.L. Design #I919, L514, L528, L530 |

PART 3 - EXECUTION

3.01 FORMS

- A. Design, erect, support, brace and maintain formwork to support vertical and lateral loads that might be applied until such loads can be supported by concrete structure. Construct formwork so concrete members and structures are of correct size, shape, alignment, elevation and position.
- B. Design formwork to be readily removable without impact, shock or damage to cast-in-place concrete surfaces and adjacent materials.
- C. Construct forms to sizes, shapes, lines and dimensions shown, and to obtain accurate alignment, location, grades, level and plumb work in finished structures. Provide for openings, offsets, keyways, recesses, blocking, screeds, bulkheads, anchorages and inserts, and other features required in work. Use selected materials to obtain required finishes. Solidly butt joints and provide back-up at joints to prevent leakage of cement paste.
- D. Fabricate forms for easy removal without hammering or prying against concrete surfaces. Provide crush plates or wrecking plates where stripping may damage cast concrete surfaces. Provide top forms for inclined surfaces where slope is too steep to place concrete with bottom forms only. Kerf wood inserts for forming keyways, reglets, recesses, and the like, to prevent swelling and for easy removal.
- E. Provide temporary openings where interior area of formwork is inaccessible for cleanout, for inspection before concrete placement, and for placement of concrete. Securely brace temporary openings and set time to forms to prevent loss of concrete mortar. Locate temporary openings on forms at inconspicuous locations.
- F. Chamfer exposed corners and edges as indicated, using wood, metal, PVC or rubber chamfer strips fabricated to product uniform smooth lines and tight edge joints.
- G. Provisions for Other Trades: Provide openings in concrete formwork to accommodate work of other trades. Determine size and location of openings, recesses and chases from trades providing such items. Accurately place and securely support items built into forms.
- H. Cleaning and Tightening: Thoroughly clean forms and adjacent surfaces to receive concrete. Remove chips, wood, sawdust, dirt or other debris just before concrete is placed. Retighten forms and bracing after concrete placement is required to eliminate mortar leaks and maintain proper alignment.

- 3.02 PLACING REINFORCEMENT: Comply with Concrete Reinforcing Steel Institute's recommended practice for "Placing Reinforcing Bars," for details and methods of reinforcement placement and supports,

SECTION 033000 - BUILDING CONCRETE WORK (continued):

and as herein specified.

- A. Clean reinforcement of loose rust and mill scale, earth, ice, and other materials which reduce or destroy bond with concrete.
- B. Accurately position, support and secure reinforcement against displacement by formwork, construction, or concrete placement operations. Locate and support reinforcing by metal chairs, runners, bolsters, spacers, and hangers, as required.
- C. Place reinforcement to obtain at least minimum coverage's for concrete protection and lap as specified by ACI. Arrange space and securely tie bars and bar supports to hold reinforcement in position during concrete placement operations. Set wire ties so ends are directed into concrete, not toward exposed concrete surfaces.
- D. Install welded wire fabric in as long lengths as practicable. Lap adjoining pieces at least one full mesh and lace splices with wire. Offset end laps in adjacent widths to prevent continuous laps in either direction.

3.03 JOINTS

- A. Construction Joints: Locate and install keyed construction joints as indicated or, if not indicated, locate so as not to impair strength and appearance of the structure, as acceptable to Architect.
- B. Provide keyways at least 1-1/2" deep in construction joints in walls, slabs and between walls and footings; accepted bulkheads designed for this purpose may be used for slabs.
- C. Place construction joints perpendicular to main reinforcement. Do not continue reinforcement across construction joints in slabs-on-grade.
- D. Isolation Joints in Slabs-on-Ground: Construct isolation joints in slabs-on-ground at points of contact between slabs on ground and vertical surfaces, such as column pedestals, foundation walls, grade beams and elsewhere as indicated.

Joint filler and sealant materials are specified in Division-7 sections of these specifications.

- E. Contraction (Control) Joints in Slabs-on-Ground: Construct contraction joints in slabs-on-ground to form panels of patterns as shown. If not shown, provide joints recommended by ACI Standards. Use inserts 1/8" to 1/4" wide x 1/4 of slab depth, unless otherwise indicated.
- F. Form contraction joints by inserting premolded plastic, hardboard or fiberboard strip into fresh concrete until top surface of strip is flush with slab surface. Tool slab edges round on each side of insert. After concrete has cured, remove inserts and clean groove of loose debris.

Where shown on the plans, contraction joints may be formed by saw cuts as soon as possible after slab finishing and without dislodging aggregate. Depth of saw cut to be 1/4 of slab thickness.

- G. Joint sealant material is specified in Division-7 sections of these specifications.

3.04 INSTALLATION OF EMBEDDED ITEMS: Set and build into work anchorage devices and other embedded items required for other work that is attached to, or supported by, cast-in-place concrete. Use setting drawings, diagrams, instructions and directions provided by suppliers of items to be attached thereto.

- A. Edge Forms and Screed Strips for Slabs: Set edge forms or bulkheads and intermediate screed strips for slabs to obtain required elevations and contours in finished slab surface. Provide and

SECTION 033000 - BUILDING CONCRETE WORK (continued):

secure units sufficiently strong to support types of screed strips by use of strike-off templates or accepted compacting type screeds.

3.05 PREPARATION OF FORM SURFACES

- A. Clean re-used forms of concrete matrix residue, repair and patch as required to return forms to acceptable surface condition.
- B. Coat contact surfaces of forms with a form-coating compound before reinforcement is placed.
- C. Thin form-coating compounds only with thinning agent of type, and in amount, and under conditions of form-coating compound manufacturer's directions. Do not allow excess form-coating material to accumulate in forms or to come into contact with in-place concrete surfaces against which fresh concrete will be placed. Apply in compliance with manufacturer's instructions.

3.06 CONCRETE PLACEMENT

- A. Pre-placement Inspection: Before placing concrete, inspect and complete formwork installation, reinforcing steel, and items to be embedded or cast- in. Notify other crafts to permit installation of their work, cooperate with other trades in setting such work. Moisten wood forms immediately before placing concrete where form coatings are not used.
- B. Coordinate the installation of joint materials and moisture barriers with placement of forms and reinforcing steel.
- C. General: Comply with ACI 304 "Recommended Practice for Measuring, Mixing, Transporting, and Placing Concrete," and as herein specified.
- D. Deposit concrete continuously or in layers of such thickness that no concrete will be placed on concrete which has hardened sufficiently to cause the formation of seams or planes of weakness. If a section cannot be placed continuously, provide construction joints as herein specified. Deposit concrete as nearly as practicable to its final location to avoid segregation.
- E. Placing Concrete in Forms: Deposit concrete in forms in horizontal layers not deeper than 24" and in a manner to avoid inclined construction joints. Where placement consists of several layers, place each layer while preceding layer is still plastic, to avoid cold joints.
- F. Consolidate placed concrete by mechanical vibrating equipment supplemented by hand- spading, Roding or tamping. Use equipment and procedures for consolidation of concrete in accordance with ACI recommended practices.
- G. Do not use vibrators to transport concrete inside forms. Insert and withdraw vibrators vertically at uniformly spaced locations not farther than visible effectiveness of machine. Place vibrators to rapidly penetrate placed layer and at least 6" into preceding layer. Do not insert vibrators into lower layers of concrete that have begun to set. At each insertion limit duration of vibration to time necessary to consolidate concrete and complete embedment of reinforcement and other embedded items without causing segregation of mix.
- H. Placing Concrete Slabs: Deposit and consolidate concrete slabs in a continuous operation, within limits of construction joints, until the placing of a panel or section is completed.
- I. Consolidate concrete during placing operations so that concrete is thoroughly worked around reinforcement and other embedded items and into corners.
- J. Bring slab surfaces to correct level with straightedge and strikeoff. Use bull floats or darbies to

SECTION 033000 - BUILDING CONCRETE WORK (continued):

smooth surface, free of humps or hollows. Do not disturb slab surfaces prior to beginning finishing operations.

- K. Maintain reinforcing in proper position during concrete placement operations.
- L. Cold Weather Placing: Protect concrete work from physical damage or reduced strength which could be caused by frost, freezing actions, or low temperatures, in compliance with ACI 306.
- M. Do not use frozen materials or materials containing ice or snow. Do not place concrete on frozen subgrade or on subgrade containing frozen materials.
- N. Do not use calcium chloride, salt and other materials containing antifreeze agents or chemical accelerators, unless otherwise accepted in mix designs.
- O. Hot Weather Placing: When hot weather conditions exist that would seriously impair quality and strength of concrete, place concrete in compliance with ACI 305.
- P. Cover reinforcing steel with water-soaked burlap if it becomes too hot, so that steel temperature will not exceed the ambient air temperature immediately before embedment in concrete.

3.07 FINISH OF FORMED SURFACES

- A. Rough Form Finish: For formed concrete surfaces not exposed-to-view in the finish work or by other construction, unless otherwise indicated. This is the concrete surface having texture imparted by form facing material used, with tie holes and defective areas repaired and patched and fins and other projections exceeding 1/4" in height rubbed down or chipped off.
- B. Smooth Form Finish: For formed concrete surfaces exposed to view, or that are to be covered with a coating material applied directly, to concrete, or a covering material applied directly to concrete, such as waterproofing, damp-proofing, painting or other similar system. This is as-cast concrete surface obtained with selected form facing material, arranged orderly and symmetrically with a minimum of seams. Repair and patch defective areas with fins or other projections completely removed and smoothed.
- C. Grout Cleaned Finish: Provide grout cleaned finish to cylindrical column surfaces which have received smooth form finish treatment.

Combine one part portland cement to 1-1/2 parts fine sand by volume, and mix with water to consistency of thick paint. Proprietary additives may be used at Contractor's option. Blend standard portland cement and white portland cement, amounts determined by trial patches, so that final color of dry grout will match adjacent surfaces.

Thoroughly wet concrete surfaces and apply grout to coat surfaces and fill small holes. Remove excess grout by scraping and rubbing with clean burlap. Keep damp by fog spray for at least 36 hours after rubbing.

3.08 MONOLITHIC SLAB FINISHES

- A. Trowel Finish: Apply trowel finish to monolithic slab surfaces to be exposed-to-view, and slab surfaces to be covered with resilient flooring, carpet, ceramic or quarry tile, paint or other thin film finish coating system.

After floating, begin first trowel finish operation using a power-driven trowel. Begin final troweling when surface produces a ringing sound as trowel is moved over surface. Consolidate concrete surface by final hand- troweling operation, free of trowel marks, uniform in texture and

SECTION 033000 - BUILDING CONCRETE WORK (continued):

appearance, and with a level surface plane so that depressions between high spots do not exceed 1/8" under a 10' straightedge. Grind smooth surface defects which would telegraph through applied floor covering system.

- B. Non-Slip Broom Finish: Apply non-slip broom finish to exterior concrete sidewalks, steps and ramps, and elsewhere as indicated.

Immediately after trowel finishing, slightly roughen concrete surface by brooming with fiber bristle broom perpendicular to main traffic route. Coordinate required final finish with Architect before application.

- 3.09 CONCRETE CURING AND PROTECTION: Protect freshly placed concrete from premature drying and excessive cold or hot temperatures. Start initial curing as soon as free water has disappeared from concrete surface after placing and finishing. Keep continuously moist for not less than 7 days at 50°F. minimum temperature. Begin final curing procedures immediately following initial curing and before concrete has dried. Continue final curing for at least 7 days in accordance with ACI 301 procedures. Avoid rapid drying at end of final curing period.

- A. Curing Methods: Perform curing of concrete by curing and sealing compound, by moist curing, by moisture-retaining cover curing, and by combinations thereof, as herein specified.

Where sealed concrete is the finish floor, moist curing is required. Where interior slabs are to be covered with VCT, resilient flooring, or carpet, etc., curing method is Contractor's Option.

- B. Provide moisture curing by following methods.

Keep concrete surface continuously wet by covering with water.

Covering concrete surface with specified absorptive cover, thoroughly saturating cover with water and keeping continuously wet. Place absorptive cover to provide coverage of concrete surfaces and edges, with 4" lap over adjacent absorptive covers.

- C. Provide moisture-cover curing as follows:

Cover concrete surfaces with moisture-retaining cover for curing concrete, placed in widest practicable width with sides and ends lapped at least 3" and sealed by waterproof tape or adhesive. Immediately repair any holes or tears during curing period using cover material and waterproof tape.

- D. Provide curing and sealing compound to interior slabs with resilient flooring, carpet over cushion; and to exterior slabs, walks, and curbs, as follows:

Applied specified curing and sealing compound to concrete slabs as soon as final finishing operations are complete (within 2 hours). Apply uniformly in continuous operation by power-spray or roller in accordance with manufacturer's directions. Recoat areas subjected to heavy rainfall within 3 hours after initial application. Maintain continuity of coating and repair damage during curing period.

- E. After moist curing of exposed concrete floor areas, provide two (2) coats of sealing compound.

Do not use membrane curing compounds on surfaces which are to be covered with coating material applied directly to concrete, liquid floor hardener, waterproofing, damp-proofing, membrane roofing, flooring (such as ceramic or quarry tile, glue-down carpet), painting, and other coatings and finish materials, unless otherwise acceptable to Architect.

SECTION 033000 - BUILDING CONCRETE WORK (continued):

F. Curing Formed Surfaces: Cure formed concrete surfaces, including undersides of beams, supported slabs and other similar surfaces by moist curing with forms in place for full curing period or until forms are removed. If forms are removed, continue curing by methods specified above, as applicable.

G. Curing Unformed Surfaces: Cure unformed surfaces, such as slabs, floor topping, and other flat surfaces by application of appropriate curing method.

Final cure concrete surfaces to receive liquid floor hardener or finish flooring by use of moisture-retaining cover, unless otherwise directed.

H. Sealer and Dustproofer: Apply a second coat of specified curing and sealing compound only to surfaces given a first coat.

3.10 REMOVAL OF FORMS AND SHORING

A. Formwork not supporting weight of concrete, such as sides of beams, walls, columns, and similar parts of the work, may be removed after cumulatively curing at not less than 50° F (10° C) for 24 hours after placing concrete, provided concrete is sufficiently hard to not be damaged by form removal operations, and provided curing and protection operations are maintained.

B. Formwork or shoring supporting weight of concrete, such as beam soffits, joints, slabs and other structural elements, may not be removed in less than 14 days and until concrete has attained design minimum compressive strength at 28-days. Determine potential compressive strength of in place concrete by testing field-cured specimens representative of concrete location or members.

C. Form facing material may be removed 4 days after placement, only if shores and other vertical supports have been arranged to permit removal of form facing material without loosening or disturbing shores and supports.

3.11 RE-USE OF FORMS: Clean and repair surfaces of forms to be re-used in work. Split, frayed, delaminated or otherwise damaged from facing material will not be acceptable for exposed surfaces. Apply new form coating compound as specified for new formwork.

3.12 MISCELLANEOUS CONCRETE ITEMS

A. Filling-In: Fill-in holes and openings left in concrete structures for passage of work by other trades, unless otherwise shown or directed, after work of other trades is in place. Mix, place and cure concrete as herein specified, to blend with in-place construction. Provide other miscellaneous concrete filling shown or required to complete work.

B. Curbs: Provide monolithic finish to interior curbs by stripping forms while concrete is still green and steel-troweling surfaces to a hard, dense finish with corners, intersections and terminations slightly rounded.

C. Equipment Bases and Foundations: Provide machine and equipment bases and foundations, as shown on drawings. Set anchor bolts for machines and equipment to template at correct elevations, complying with certified diagrams or templates of manufacturer furnishing machines and equipment.

D. Grout base plates and foundations as indicated, using specified non-shrink grout. Use non-metallic grout for exposed conditions, unless otherwise indicated.

E. Reinforced Masonry: Provide concrete for reinforced masonry lintels and bond beams where indicated on drawings and as scheduled. Maintain accurate location of reinforcing steel during

SECTION 033000 - BUILDING CONCRETE WORK (continued):

concrete placement.

3.13 CONCRETE SURFACE REPAIRS

- A. Patching Defective Areas: Repair and patch defective areas with cement mortar immediately after removal of forms, when acceptable to Architect.
Cut out honeycomb, rock pockets, voids over 1/4" in any dimension, and holes left by tie rods and bolts, down to solid concrete but, in no case to a depth of less than 1". Make edges of cuts perpendicular to the concrete surface. Thoroughly clean, dampen with water and brush- coat the area to be patched with specified bonding agent. Place patching mortar after bonding compound has dried.
- B. For exposed-to-view surfaces, blend white portland cement and standard portland cement so that, when dry, patching mortar will match color surrounding. Provide test areas at inconspicuous location to verify mixture and color match before proceeding with patching. Compact mortar in place and strike-off slightly higher than surrounding surface.
- C. Repair of Formed Surfaces: Remove and replace concrete having defective surfaces if defects cannot be repaired to satisfaction of Architect. Surface defects, as such, include color and texture irregularities, cracks, spalls, air bubbles, honeycomb, rock pockets; fins and other projections on surface; and stains and other discolorations that cannot be removed by cleaning; flush out form tie holes, fill with dry pack mortar, or precast cement cone plugs secured in place with bonding agent.
- D. Repair concealed formed surfaces, where possible, that contain defects that affect the durability of concrete. If defects cannot be repaired, remove and replace concrete.
- E. Repair of Unformed Surfaces: Test unformed surfaces, such as monolithic slabs, for smoothness and verify surface plane to tolerances specified for each surface and finish. Correct low and high areas as herein specified. Test unformed surfaces sloped to drain for trueness of slope, in addition to smoothness using a template having required slope.
- F. Repair finished unformed surfaces that contain defects which affect durability of concrete. Surface defects, as such, include crazing, cracks in excess of 0.01" wide or which penetrate to reinforcement of completely through non-reinforced sections regardless of width, spalling, pop-outs, honeycomb, rock pockets and other objectionable conditions.
- G. Correct high areas in unformed surfaces by grinding, after concrete has cured at least 14 days.
- H. Correct low areas in unformed surfaces during, or immediately after completion of surface finishing operations by cutting out low areas and replacing with fresh concrete. Finish repaired areas to blend into adjacent concrete. Proprietary patching compounds may be used when acceptable to Architect.
- I. Repair defective areas, except random cracks and single holes not exceeding 1" diameter, by cutting out and replacing with fresh concrete. Remove defective areas to sound concrete with clean, square cuts and expose reinforcing steel with at least 3/4" clearance all around. Dampen concrete surfaces in contact with patching concrete and apply bonding compound. Mix patching concrete of same materials to provide concrete of same type or class as original concrete. Place, compact and finish to blend with adjacent finish concrete. Cure in same manner as adjacent concrete.
- J. Repair isolated random cracks and single holes not over 1" in diameter by dry-pack method. Groove top of cracks and cut-out holes to sound concrete and clean of dust, dirt and loose particles. Dampen cleaned concrete surfaces and apply bonding compound. Mix dry-pack, consisting of one part portland cement to 2-1/2 parts fine aggregate passing a No. 16 mesh sieve,

SECTION 033000 - BUILDING CONCRETE WORK (continued):

using only enough water as required for handling and placing. Place dry-pack after bonding compound has dried. Compact dry-pack mixture in place and finish to match adjacent concrete. Keep patched area continuously moist for not less than 72 hours.

- K. Perform structural repairs with prior approval of Architect or method and procedure, using specified epoxy adhesive and mortar.
- L. Repair methods not specified above may be used, subject to acceptance of Architect.

3.14 **QUALITY CONTROL TESTING DURING CONSTRUCTION**

- A. The Contractor will employ a testing laboratory to perform tests and to submit test reports.
- B. Sampling and testing for quality control during placement of concrete includes the following, as directed by Architect.
- C. Sampling Fresh Concrete: ASTM C172, except modified for slump to comply with ASTM C94.
 - 1. Slump: ASTM C143; one test at point of discharge for each day's pour of each type of concrete; additional tests when concrete consistency seems to have changed.
 - 2. Air Content: ASTM C 173; volumetric method for lightweight or normal weight concrete; ASTM C 231 pressure method for normal weight concrete; one for each day's pour of each type of air- entrained concrete.
 - 3. Concrete Temperature: Test hourly when air temperature is 40°F (4°C) and below, and when 80°F (27°C) and above; and each time a set of compression test specimens made.
 - 4. Compression Test Specimen: ASTM C31; one set of 4 standard cylinders for each compressive strength test, unless otherwise directed. Mold and store cylinders for laboratory cured test specimens.
 - 5. Compressive Strength Tests: ASTM C39; one set for each day's pour exceeding 5 cu. yds. plus additional sets for each 25 cu. yds. over and above the first 25 cu. yds. of each concrete class placed in any one day; one specimen tested at 7 days, two specimens tested at 28 days, and one specimen retained in reserve for later testing if required. When frequency of testing will provide less than 2 strength tests for a given class of concrete, conduct testing from each batch.
- D. Test results will be reported in writing to Architect. Reports of compressive strength tests shall contain the project identification name and number, date of concrete placement, name of concrete testing service, concrete type and class, location of concrete batch in structure, design compressive strength at 28 days, compressive breaking strength and type of break for both 7-day tests and 28-day tests.
- E. Additional Tests: The testing service will make additional tests of in-place concrete when test results indicate specified concrete strengths and other characteristics have not been attained in the structure, as directed by Architect. Testing service may conduct tests to determine adequacy of concrete by cored cylinders complying with ASTM C42, or by other methods as directed. Contractor shall pay for such tests conducted, and any other additional testing as may be required when unacceptable concrete is verified.

END OF SECTION 033000

SECTION 033200 - CONCRETE FLOOR TOPPING

PART 1 - GENERAL

1.01 DESCRIPTION: This section specifies material and installation standards for the application of cementitious floor toppings.

1.02 RELATED WORK

Section 093000 - Tile.
Section 094000 - Key Epoxy Terrazzo.
Section 096516 - Sheet Vinyl Flooring.
Section 096500 - Resilient Tile Flooring.
Section 099100 - Painting.

1.03 EXTENT

1-1/2 inch topping over the prepared existing concrete slab as required to provide a new substrate for new floor finishes or level existing ceramic tile and/or sloped floor areas where floor drains are to be removed.

1.04 TYPES OF CONCRETE FLOOR TOPPINGS INCLUDE

Type A: Trowelable topping for slopes 2% or less at shower areas, to receive ceramic tile surfacing.

Type B: Standard topping for patching and leveling, and for general areas to receive carpeting and vinyl composition tile.

1.05 SUBMITTALS

In accordance with Section 013000 - Submittals, furnish manufacturer's literature, including installation instructions.

1.06 DELIVERY AND STORAGE

Deliver materials in their original labeled and dated packages. Protect from freezing, heat, and moisture.

PART 2 - PRODUCTS

2.01 GENERAL REQUIREMENTS

- A. Ready-mixed toppings shall comply with ASTM C94. Floor topping mixtures shall contain Portland Cement to conform to ASTM C150, Type I or Type III, with additives and binders approved by the manufacturer to meet the following general requirements for each type:
1. ASTM C109/mod: 4,100 psi minimum compressive strength at 28 days.
 2. Maximum weight without aggregates: 9.5 pounds per square foot per inch thickness.
 3. Product not to exceed shelf-life as labeled.
 4. ASTM E84-81a: Flame spread = 0,
 Fuel contribution = 0,
 Smoke development = 0.
 5. Product to be water-resistant.
- B. Mixing water to be clean and potable.

SECTION 033200 - CONCRETE FLOOR TOPPING (continued):

- C. Aggregate:
 - 1. Type A: Fine Aggregate, ASTM C33 to consist of sand or crushed stone screenings; clean hard, and free from organic matter. 3/8" maximum size. Aggregate 1/3 to 1 part topping mix by volume.
 - 2. Type B: Well-graded, washed gravel, 1/8" to 1/2". Do not use sand. Add 1 part aggregate to 1 part topping mix by volume.
- D. Primer: As approved by the topping manufacturer.

PART 3 - EXECUTION

3.01 PREPARATION

- A. Saw-cut 1/4 inch or more neatly around patch areas in concrete.
- B. Thoroughly clean concrete to be free of oil, wax, grease, latex compounds, curing and sealing compounds and any contaminant that could act as a bond-breaker, before priming.
- C. Remove damaged surfaces to sound solid concrete by mechanical methods.
- D. Roughen the surface to prepare for bonding.
- E. Vacuum and wet-mop surfaces prior to application of primer. Determine from the test areas if two coats of primer are required over extremely absorbent concrete; if so, apply the second coat only after the first has dried completely but not within less than four hours.
- F. Keep the primed surface clean and free of material.
- G. Follow manufacturer's requirements for preparation.

3.02 INSTALLATION

- A. Install at temperatures of 50 degrees F or more.
- B. Install quickly if warm conditions prevail, by recommended manual or pumping installation.
- C. Install at the recommended maximum thickness for each type, observing the rules of basic concrete work.
- D. Follow manufacturer's requirements for installation.
- E. Where joints are required, match to joints in base slab. Mark locations of joints so top course joints can be placed directly over them.

3.03 LEVELING

- A. Finish Type A toppings with a highway straightedge, bull float or darby to level. Float the surface to a sandy texture after it has sufficiently stiffened to permit the operation and water sheen has disappeared. Uniformly slope surface to drain.
- B. Level Type B Topping as above, unless of the self-leveling topping-mixture type.

SECTION 033200 - CONCRETE FLOOR TOPPING (continued):

- C. Finish to assure a level plane, true to within 1/8 inch maximum deviation in 10 feet, non-accumulatively, in accordance with ACI (72)75, Class A Flatness Tolerance or to achieve a FF20/FL17 tolerance tested in accordance with ASTM E1155. Uniformly slope surface to drains. Feather topping to meet level at existing surfaces.
- 3.04 FINISHING: Cure and protect topping applications as for standard "Concrete Work".
- 3.05 PERFORMANCE
- A. The topping for each type must bond securely to the concrete substrate. (Failure to do so may be evidenced by a hollow sound when tapped.)
 - B. The topping shall not disintegrate or fail, as a surface for applied finishes for Types A and B.
 - C. Failure of the concrete topping, after approval of final application, shall be considered failure of materials and workmanship. Repair or replace toppings and finishes (where damaged by topping failure) in areas of such failures, as directed.

END OF SECTION 033200

SECTION 042000 - UNIT MASONRY

PART 1 - GENERAL

1.01 QUALITY ASSURANCE

- A. Single Source Responsibility for Masonry Units: Obtain exposed masonry units of uniform texture and color, or a uniform blend within the ranges accepted for these characteristics, from one manufacturer for each different product required for each continuous surface or visually related surfaces.
- B. Single Source Responsibility for Mortar Materials: Obtain mortar ingredients of uniform quality, including color for exposed masonry, from one manufacturer for each cementitious component and from one source and producer for each aggregate.
- C. Preconstruction Tests by Unit Test Methods: Test the following materials by methods indicated:
 - 1. Concrete Masonry Units: Test each type, class and grade of concrete masonry unit per ASTM C 140.
 - 2. Mortar Tests: Test each mortar type per ASTM C780.
- D. Preconstruction Tests by Prism Methods: For each type of wall construction indicated for testing, test masonry prisms per ASTM E 447, Method B and as follows:
 - 1. Prepare one set of prisms for testing at 7 days and one set for testing at 28 days.
 - 2. Fabricate concrete masonry prisms with height-to-thickness ratio of not less than 1.33 nor more than 3.0.
 - 3. Flexural Bond Strength Tests: Where indicated, also test prisms per ASTM C 518; place prisms with tooled joints facing downward.

1.02 SUBMITTALS

- A. Product Data: Submit manufacturer's product data for each type of masonry unit, accessory, and other manufactured products, including certifications that each type complies with specified requirements.

1.03 DELIVERY, STORAGE, AND HANDLING

- A. Deliver masonry materials to project in undamaged condition.
- B. Store and handle masonry units to prevent their deterioration or damage due to moisture, temperature changes, contaminants, corrosion or other causes.
 - 1. Limit moisture absorption of concrete masonry units during delivery and until time of installation to the maximum percentage specified for Type I units for the average annual relative humidity as reported by the U.S. Weather Bureau Station nearest project site.
 - 2. Store cementitious materials off the ground, under cover and in dry location.
 - 3. Store aggregates where grading and other required characteristics can be maintained.
 - 4. Store masonry accessories including metal items to prevent deterioration by corrosion and accumulation of dirt.

1.04 PROJECT CONDITIONS

- A. Protection of Work: During erection, cover top of walls with waterproof sheeting at end of each day's work. Cover partially completed structures when work is not in progress.

SECTION 042000 - UNIT MASONRY (continued):

- B. Extend cover a minimum of 24 inches down both sides and hold cover securely in place.
- C. Do not apply uniform floor or roof loading for at least 12 hours after building masonry walls or columns.
- D. Do not apply concentrated loads for at least 3 days after building masonry walls or columns.
- E. Staining: Prevent grout or mortar or soil from staining the face of masonry to be left exposed or painted. Remove immediately grout or mortar in contact with such masonry.
- F. Protect base of walls from rain-splashed mud and mortar splatter by means of covering spread on ground and over wall surface.
- G. Protect sills, ledges and projections from droppings of mortar.
- H. Cold Weather Protection:
 - 1. Do not lay masonry units which are wet or frozen.
 - 2. Remove any ice or snow formed on masonry bed by carefully applying heat until top surface is dry to the touch.
 - 3. Remove masonry damaged by freezing conditions.

PART 2 - PRODUCTS

- 2.01 CONCRETE MASONRY UNITS: Comply with referenced standards and other requirements indicated below applicable to each form of concrete masonry unit required.
- A. Provide special shapes where required for lintels, corners, jambs, sash, control joints, headers, bonding and other special conditions. Use 45E block at all locations where walls intersect at a 45E angle.
 - B. Provide square-edged units for outside corners, except where indicated as bullnose.
 - C. Grade N except Grade S may be used above grade in exterior walls with weather protective coatings and in walls not exposed to weather.
 - D. Typical Size: Manufacturer's standard units with nominal face dimensions of 16" long x 8" high (15-5/8" x 7-5/8" actual) x thicknesses indicated.
 - E. Block Shapes:
 - 1. Standard Block: 8" x 8" x 16" standard gray.
 - 2. 45E Block: 8" x 8" x 8" - 16".
 - 3. Single Scored Block: 8" x 8" x 16"; color and type to match existing exterior.
 - F. Type II, non-moisture controlled units.
 - G. Exposed Faces: Manufacturer's standard color and texture, unless otherwise indicated.

Note: All CMU, visible to view and not designated to receive a finish on Finish Schedule or elsewhere in the documents, shall receive block filler and paint as specified in Section 099000, except mechanical chases. Mechanical chases are not to be painted.

SECTION 042000 - UNIT MASONRY (continued):

H. Hollow Loadbearing Block: Requirements for block when delivered to job site. ASTM C 90 and as follows:

1. Weight Classification: Light weight.
2. Minimum Compressive Strength: 2000 psi (average of 3 units).
3. Maximum Water Absorption: 18 lbs/ft.
4. Maximum Percent with Slight Cracks and Chips: 5%.

2.02 MORTAR AND GROUT MATERIALS

A. Portland Cement: ASTM C 150, Type I, except Type III may be used for cold weather construction. Provide natural color or white cement as required to produce required mortar color.

B. Water: Clean and potable.

2.03 JOINT REINFORCEMENT, TIES, AND ANCHORING DEVICES:

A. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products which may be incorporated in the work include, but are not limited to, the following:

Dur-O-Wall, Inc.
Masonry Reinforcing Corp. of America
National Wire Products Corp.

B. Materials: Comply with requirements indicated below for basic materials and with requirements indicated under each form of joint reinforcement, tie and anchor for size and other characteristics:

1. Hot-Dip Galvanized Steel Wire: ASTM A 82 for uncoated wire and ASTM A 153 for zinc coated wire.
2. Application: Use for masonry exposed to exterior and in contact with earth.

C. Joint Reinforcement: Provide welded-wire units prefabricated with deformed continuous side rods and plain cross rods into straight lengths of not less than 10', with prefabricated corner and tee units, and complying with requirements indicated below:

1. Width: Fabricate joint reinforcements in units with widths of approximately 2" less than nominal width of walls and partitions as required to provide mortar coverage of not less than 5/8" on joint faces exposed to exterior and 1/2" elsewhere.
2. Wire Size for Side Rods: 9 gauge.
3. Wire Size for Cross rods: 9 gauge.
4. For single-wythe masonry provide type as follows with single pair of side rods:
Ladder design spaced not more than 16" o.c.

D. Anchor Bolts: Provide steel bolts with hex nuts and flat washers complying with ASTM A 307, Grade A, hot-dip galvanized to comply with ASTM C 153, Class C, in sizes and configuration indicated.

2.04 MASONRY CLEANERS

A. Job-Mixed Detergent Solution: Solution of trisodium phosphate (1/2 cup dry measure) and laundry detergent (1/2 cup dry measure) dissolved in one gallon of water. **Verify with block manufacturer.**

SECTION 042000 - UNIT MASONRY (continued):

- 2.05 MORTAR AND GROUT MIXES: Do not add admixtures including coloring pigments, air-entraining agents, accelerators, retarders, water repellent agents, anti-freeze compounds or other admixtures, unless otherwise indicated.

Do not use calcium chloride in mortar or grout.

- A. Mixing: Combine and thoroughly mix cementitious, water and aggregates in a mechanical batch mixer; comply with referenced ASTM standards for mixing time and water content.
- B. Mortar for Unit Masonry: Comply with ASTM C 270, Proportion Specification, for types of mortar required, unless otherwise indicated.
 - 1. Use Type M or S mortar for all masonry on project.
- C. Grout (Pea Gravel Conc.) for Unit Masonry: Comply with ASTM C 476 for grout for use in construction of reinforced unit masonry. Use grout of consistency indicated or if not otherwise indicated, of consistency (fine or coarse) at time of placement which will completely fill all spaces intended to receive grout.
 - 1. Use coarse grout in grout spaces 4" or more in least horizontal dimension, unless otherwise indicated.

- 2.06 VERTICAL EXPANSION JOINTS: Provide ASlot Seal Wide Flange 2016-3" expansion joints by Williams Products, Inc. OR approved equal, unless detailed on drawings otherwise.

PART 3 - EXECUTION

3.01 INSTALLATION, GENERAL

- A. Do not wet concrete masonry units.
- B. Cleaning Reinforcing: Before placing, remove loose rust, ice and other coatings from reinforcing.
- C. Thickness: Build cavity and composite walls, floors and other masonry construction to the full thickness shown. Build single-wythe walls (if any) to the actual thickness of the masonry units, using units of nominal thickness indicated.
- D. Leave openings for equipment to be installed before completion of masonry work. After installation of equipment, complete masonry work to match work immediately adjacent to the opening.
- E. Cut masonry units using motor-driven saws to provide clean, sharp, unchipped edges. Cut units as required to provide continuous pattern and to fit adjoining work. Use full-size units without cutting where possible.

Use dry cutting saws to cut concrete masonry units.

3.02 CONSTRUCTION TOLERANCES

- A. Variation from Plumb: For vertical lines and surfaces of columns, and walls, do not exceed 1/4" in 10', or 3/8" in a story height not to exceed 20', nor 1/2" in 40' or more. For external corners, expansion joints, control joints and other conspicuous lines, do not exceed 1/4" in any story or 20' maximum, nor 1/2" in 40' or more. For vertical alignment of head joints do not exceed plus or

SECTION 042000 - UNIT MASONRY (continued):

minus 1/4" in 10', 1/2" maximum.

- B. Variation from Level: For bed joints and lines of exposed lintels, sills, parapets, horizontal grooves and other conspicuous lines, do not exceed 1/4" in any bay or 20' maximum, nor 1/2" in 40' or more. For top surface of bearing walls do not exceed 1/8" between adjacent floor elements in 10' or 1/16" within width of a single unit.
- C. Variation of Linear Building Line: For position shown in plan and related portion of columns, walls and partitions, do not exceed 1/2" in any bay or 20' maximum, nor 3/4" in 40' or more.
- D. Variation in Cross-Sectional Dimensions: For columns and thickness of walls, from dimensions shown, do not exceed minus 1/4" nor plus 1/2".
- E. Variation in Mortar Joint Thickness: Do not exceed bed joint thickness indicated by more than plus or minus 1/8", with a maximum thickness limited to 1/2". Do not exceed head joint thickness indicated by more than plus or minus 1/8".

3.03 LAYING MASONRY WALLS

- A. Layout walls in advance for accurate spacing of surface bond patterns with uniform joint widths and to accurately locate openings, movement-type joints, returns and offsets. Avoid the use of less-than-half-size units at corners, jambs and wherever possible at other locations.
- B. Lay-up walls to comply with specified construction tolerances, with courses accurately spaced and coordinated with other work.
- C. Pattern Bond: Lay exposed masonry in running bond with vertical joint in each course centered on units in courses above and below. Lay concealed masonry with all units in a wythe in running bond or bonded by lapping not less than 2". Bond and interlock each course of each wythe at corners. Do not use units with less than nominal 4" horizontal face dimensions at corners or jambs. Match existing exterior pattern.
- D. Stopping and Resuming Work: Rack back 1/2-unit length in each course; do not tooth. Clean exposed surfaces of set masonry, wet units lightly (if required) and remove loose masonry units and mortar prior to laying fresh masonry.
- E. Built-in Work: As the work progresses, build-in items specified under this and other sections of these specifications. Fill in solidly with masonry around built-in items.
 - 1. Fill space between hollow metal frames and masonry solidly with mortar, unless otherwise indicated.
 - 2. Where built-in items are to be embedded in cores of hollow masonry units, place a layer of metal lath in the joint below and rod mortar or grout into core.
 - 3. Fill cores in hollow concrete masonry units with grout under bearing plates, beams, lintels, posts and similar items, unless otherwise indicated.

3.04 MORTAR BEDDING AND JOINTING

- A. Lay hollow concrete masonry units with full mortar coverage on horizontal and vertical face shells. Bed webs in mortar in starting course on footings and in all courses of piers, columns and pilasters, and where adjacent to cells or cavities to be reinforced or filled with concrete or grout. For starting course on footings where cells are not grouted, spread out full mortar bed including areas under cells.

SECTION 042000 - UNIT MASONRY (continued):

- B. Maintain joint widths shown, except for minor variations required to maintain bond alignment. If not shown, lay walls with 3/8" joints.
- C. Cut joints flush for masonry walls which are to be concealed or to be covered by other materials, unless otherwise indicated.
- D. Tool exposed joints slightly concave using a jointer larger than joint thickness, unless otherwise indicated.
- E. Remove masonry units disturbed after laying; clean and reset in fresh mortar. Do not pound corners or jambs to shift adjacent stretcher units which have been set in position. If adjustments are required, remove units, clean off mortar and reset in fresh mortar.

3.05 HORIZONTAL JOINT REINFORCEMENT: Provide continuous horizontal joint reinforcement at 16" C-C. Install longitudinal side rods in mortar for their entire length with a minimum cover of 5/8" on exterior side of walls 1/2" elsewhere. Lap reinforcing a minimum of 6".

- A. Cut or interrupt joint reinforcement at control and expansion joints, unless otherwise indicated.
- B. Provide continuity at corners and wall intersections by use of prefabricated "L" and "T" sections. Cut and bed reinforcement units as directed by manufacturer for continuity at returns, offsets, column fireproofing, pipe enclosures and other special conditions.

Space continuous horizontal reinforcement as follows:

For single-wythe walls, space reinforcement at 16" o.c. vertically, unless otherwise indicated.

- C. Reinforce masonry openings greater than 1'-0" wide, with horizontal joint reinforcement placed in 2 horizontal joints approximately 8" apart, immediately above the lintel and immediately below the sill. Extend reinforcement a minimum of 2'-0" behind jambs of the opening except at control joints.

3.06 CONTROL AND EXPANSION JOINTS

- A. Vertical Control Joints: Provide control joints in CMU walls to allow for movement resulting from shrinkage and creep. Provide control joints as detailed and at locations shown on drawings, or if not shown, as indicated below. Provide control joints in both exterior and interior walls, and in both loadbearing and non-loadbearing conditions.

3.07 FIELD QUALITY CONTROL

- A. Contractor shall employ, at his own expense, a testing laboratory experienced in performing types of masonry field quality control tests for masonry indicated. Comply with requirements for qualification and acceptance of testing laboratory specified in Part 1 for preconstruction testing service.
- B. Remove and replace masonry units which have cracked do to shrinkage or settlement problems. Provide new units to match adjoining units and install in fresh mortar, pointed to eliminate evidence of replacement.

SECTION 042000 - UNIT MASONRY (continued):

C. Unit Test Method:

1. Concrete Masonry Unit Tests: For each type, class and grade of concrete masonry unit indicated, test units by method of sampling and testing of ASTM C 140.
2. Mortar Tests: For each type indicated, test mortar by methods of sampling and testing of ASTM C 780. Conduct tests no less frequently than that required to evaluate mortar used to install each increment of masonry units indicated above from which samples are taken for testing.

D. Prism Test Method:

1. Compression Test: For each type of wall construction indicated for testing, test masonry prisms by methods of sampling and testing of ASTM E 447, Method B, and as follows:

Prepare one set of prisms for testing at 7 days and one set for testing at 28 days.

E. Report test results in writing and in form specified under each test method, to Architect and Contractor, on same day tests are made.

F. Evaluation of Quality Control Tests: Masonry work, in absence of other indications of noncompliance with requirements, will be considered satisfactory if results from construction quality control tests comply with minimum requirements indicated.

3.08 REPAIR, POINTING AND CLEANING

A. Remove and replace masonry units which are loose, chipped, broken, stained or otherwise damaged, or if units do not match adjoining units as intended. Provide new units to match adjoining units and install in fresh mortar or grout, pointed to eliminate evidence of replacement.

B. Remove and replace masonry units which have cracked do to shrinkage or settlement problems. Provide new units to match adjoining units and install in fresh mortar, pointed to eliminate evidence of replacement.

C. Pointing: During the tooling of joints, enlarge any voids or holes, except weep holes, and completely fill with mortar. Point-up all joints, including corners, openings, and adjacent work, to provide a neat, uniform appearance, prepared for application of sealants.

D. Final Cleaning: After mortar is thoroughly set and cured, clean masonry as follows:

1. Remove large mortar particles by hand with wooden paddles and non-metallic scrape hoes or chisels.
2. Test cleaning methods on sample wall panel; leave 1/2 panel uncleaned for comparison purposes. Obtain Architect's approval of sample cleaning before proceeding with cleaning of masonry.
3. Clean concrete unit masonry to comply with masonry manufacturer's directions and applicable NCMA "Tek" bulletins.
4. Do not use acid or abrasives on finish surfaces of ground faced accent block.

E. Protection: Provide final protection and maintain conditions in a manner acceptable to Installer, which ensures unit masonry work being without damage and deterioration at time of substantial completion.

END OF SECTION 042000

SECTION 051200 - STRUCTURAL STEEL

PART 1 - GENERAL

1.01 RELATED DOCUMENTS: Drawings and general provisions of Contract, including General and Supplementary Conditions and Division-1 Specification sections, apply to work of this section.

1.02 DESCRIPTION OF WORK:

- A. Extent of structural steel work is shown on drawings, including schedules, notes and details to show size and location of members, typical connections, and type of steel required.
- B. Structural steel is that work defined in AISC "Code of Standard Practice" and as otherwise shown on drawings.
- C. Miscellaneous Metal Fabrications are specified elsewhere in Division 5.

1.03 QUALITY ASSURANCE

- A. Codes and Standards: Comply with provisions of following, except as otherwise indicated:
 - 1. AISC "Code of Standard Practice for Steel Buildings and Bridges"
 - 2. Paragraph 4.2.1 of the above code is hereby modified by deletion of the following sentence: "This approval constitutes the Design Builder's acceptance of all responsibility for the decision adequacy of any connections designed by the fabricator as a part of his preparation of these shop drawings."
 - 3. AISC "Specifications for Structural Steel Buildings," including "Commentary" and Supplements thereto as issued.
 - 4. AISC "Specifications for Structural Joints using ASTM A 325 or A 490 Bolts" approved by the Research Council on Riveted and Bolted Structural Joints of the Engineering Foundation.
 - 5. AWS D1.1 "Structural Welding Code"
 - 6. ASTM A6 "General Requirements for Delivery of Rolled Steel Plates, Shapes, Sheet Piling and Bars for Structural Use"
- B. Qualifications for Welding Work: Qualify welding processes and welding operators in accordance with AWS "Standard Qualification Procedure." Provide certification that welders to be employed in work have satisfactorily passed AWS qualification tests. Certification must be current. If recertification of welders is required, retesting will be Contractor's responsibility. Contractor must furnish a copy of each welder's current certification prior to welder performing work on the project.
- C. Installer Qualifications: Engage an experienced installer who has completed structural steel work similar in material, design, and extent to that indicated for this project and with a record of successful in-service performance.
- D. Fabricator Qualifications: Engage a firm experienced in fabricating structural steel similar to that indicated for this project and with a record of successful in-service performance, as well as sufficient production capacity to fabricate structural steel without delaying the work.
 - 1. Fabricator must participate in the AISC Quality Certification Program and be designated an AISC-Certified Plant as follows:
 - a. Category: Category I, conventional steel structures.
 - b. Fabricator shall be registered with and approved by authorities having jurisdiction.

SECTION 051200 - STRUCTURAL STEEL (continued):

- E. Firms wishing to bid the work, but not participating in the AISC Certification, may seek pre-qualification by making submittals as listed in paragraph 1.04 Submittals, Para. D, of this section.
- F. Whether by Certification or by Pre-Qualification, the steel fabricator shall have in their employ a specialty Engineer responsible for designing and detailing all structural connections and have responsible charge of shop drawing preparation. Fabricator shall anticipate and include in his bid all miscellaneous plates, angles, welds, or bolts necessary to accomplish the connection. Specialty Engineer shall sign and seal shop drawings indicating responsibility for connections only, and certifying that main members are as indicated on the contract documents. Connections shall be capable of resisting forces equal to the strength of the member being connected, when such forces are not shown on the plans.

1.04 SUBMITTALS

- A. Product Data: Submit producer's or manufacturer's specifications and installation instructions for following products. Include laboratory test reports and other data to show compliance with specifications (including specified standards).
 - 1. Structural steel (each type).
 - 2. High-strength bolts (each type), including nuts and washers.
 - 3. Structural steel primer paint.
 - 4. Shrinkage-resistant grout.
- B. Shop Drawings: Submit shop drawings, including complete details and schedules for fabrication and assembly of structural steel members procedures and diagrams. Include details of cuts, connections, camber, holes, and other pertinent data. Indicate welds by standard AWS symbols, and show size, length, and type of each weld. Provide setting drawings, templates, and directions for installation of anchor bolts and other anchorages to be installed by others.

Shop drawings relating to the connections shall be signed and sealed by the fabricators engineer, who is registered in the State of Florida.

Any submittal or RFI shall be incorporated as part of the shop drawings. The first and all shop drawing submittals shall include the signature and seal of the Specialty Engineer, noting the purpose of the submittal.
- C. Test Reports: Submit copies of reports of tests conducted on shop and field bolted and welded connections. Include data on type(s) of tests conducted and test results.
- D. Qualification data for firms and persons specified in the "Quality Assurance" Article to demonstrate their capabilities and experience. Include lists of completed projects with project name and address, name and address of Architect and Design Builder, and the name and address of the Specialty Engineer proposed for the work.

1.05 DELIVERY, STORAGE AND HANDLING

- A. Deliver materials to site at such intervals to insure uninterrupted progress of work.
- B. Deliver anchor bolts and anchorage devices, which are to be embedded in cast-in-place concrete or masonry, in ample time to not to delay work.
- C. Store materials to permit easy access for inspection and identification. Keep steel members off ground, using pallets, platforms, or other supports. Protect steel members and packaged materials from erosion and deterioration.

SECTION 051200 - STRUCTURAL STEEL (continued):

- D. Do not store materials on structure in a manner that might cause distortion or damage to members or supporting structures. Repair or replace damaged materials or structures as directed.

PART 2 - PRODUCTS

2.01 MATERIALS

- A. Metal Surfaces, General: For fabrication of work which will be exposed to view, use only materials which are smooth and free of surface blemishes including pitting, seam marks, roller marks, rolled trade names and roughness. Remove such blemishes by grinding, or by welding and grinding, prior to cleaning, treating and application of surface finishes.
- B. Structural Steel Shapes, Plates and Bars: ASTM A 572.
- C. Cold-Formed Steel Tubing: ASTM A 500, Grade B.
- D. Steel Pipe: ASTM A 53, Type E or S, Grade B.
- E. Anchor Bolts: ASTM F 1554, nonheaded type unless otherwise indicated.
- F. High-Strength Threaded Fasteners: Heavy hexagon structural bolts, heavy hexagon nuts, and hardened washers, as follows:
1. Quenched and tempered medium-carbon steel bolts, nuts and washers, complying with ASTM A 325.
 2. Direct tension indicator washers may be used at Contractor's option.
- G. Electrodes for Welding: Comply with AWS Code.
- H. Structural Steel Primer Paint: Fabricator's standard rust-inhibiting primer.
- I. Non-metallic Shrinkage-Resistant Grout: Pre-mixed, non-metallic, non-corrosive, non-staining product containing selected silica, sands, portland cement, shrinkage compensating agents, plasticizing and water reducing agents, complying with CRD-C621.

Available Products: Subject to compliance with requirements, products which may be incorporated in the work include, but are not limited to, the following:

Euco N.S.; Euclid Chemical Co.
Masterflow 713; Master Builders
Five Star Grout; U.S. Grout Corp.

2.02 FABRICATION

- A. Shop Fabrication and Assembly: Fabricate and assemble structural assemblies in shop to greatest extent possible. Fabricate items of structural steel in accordance with AISC Specifications and as indicated on final shop drawings. Provide camber in structural members where indicated. Properly mark and match-mark materials for field assembly. Fabricate for delivery sequence which will expedite erection and minimize field handling of materials.

SECTION 051200 - STRUCTURAL STEEL (continued):

- B. Connections: Weld or bolt shop connections, as indicated. Weld field connections, except where bolted connections or other connections are indicated.
1. Provide high-strength threaded fasteners for principal bolted connections, except where unfinished bolts are indicated.
 2. Provide unfinished threaded fasteners for only bolted connections of secondary framing members to primary members (including purlins, girts, and other framing members taking only nominal stresses) and for temporary bracing to facilitate erection.
- C. High-Strength Bolted Construction: Install high-strength threaded fasteners in accordance with AISC "Specifications for Structural Joints using ASTM A 325 or A 490 Bolts" (RCRBSJ).
- D. Welded Construction: Comply with AWS Code for procedures, appearance and quality of welds, and methods used in correcting welding work. Build up welded door frames attached to structural steel framing. Weld exposed joints continuously and grind smooth. Plug weld steel bar stops to frames, except where shown removable. Secure removable stops to frames with countersunk, cross-recessed head machine screws, uniformly spaced not more than 10" o.c., unless otherwise indicated.
- E. Holes for Other Work: Provide holes required for securing other work to structural steel framing, and for passage of other work through steel framing members, as shown on final shop drawings. Provide threaded nuts welded to framing, and other specialty items as indicated to receive other work. Cut, drill, or punch holes perpendicular to metal surfaces. Do not flame cut holes or enlarge holes by burning. Drill holes in bearing plates.

2.03 SHOP PAINTING

- A. General: Shop paint structural steel, except those members or portions of members to be embedded in concrete or mortar. Paint embedded steel which is partially exposed on exposed portions and initial 2" of embedded areas only.
1. Do not paint surfaces which are to be welded or high-strength bolted with friction-type connections.
 2. Apply 2 coats of paint to surfaces which are inaccessible after assembly or erection. Change color of second coat to distinguish it from first.
- B. Surface Preparation: After inspection and before shipping, clean steel work to be painted. Remove loose rust, loose mill scale, and spatter, slag or flux deposits. Clean steel in accordance with Steel Structures Painting Council (SSPC) as follows:
1. SP-2 "Hand Tool Cleaning"
 2. SP-3 "Power Tool Cleaning"
- C. Painting: Immediately after surface preparation, apply structural steel primer paint in accordance with manufacturer's instructions and at a rate to provide dry film thickness of not less than 1.5 mils. Use painting methods which result in full coverage of joints, corners, edges and exposed surfaces.

SECTION 051200 - STRUCTURAL STEEL (continued):

PART 3 - EXECUTION

3.01 ERECTION

- A. Temporary Shoring and Bracing: Provide temporary shoring and bracing members with connections of sufficient strength to bear imposed loads. Remove temporary members and connections when permanent members are in place and final connections are made. Provide temporary guy lines to achieve proper alignments of structures as erection proceeds.
- B. Temporary Planking: Provide temporary planking and working platforms as necessary to effectively complete work.
- C. Anchor Bolts: Furnish anchor bolts and other connectors required for securing structural steel to foundations and other in-place work. Furnish templates and other devices as necessary for presetting bolts and other anchors to accurate locations. Refer to Division 3 of these Specifications for anchor bolt installation requirements in concrete, and Division 4 for masonry installation.
- D. Setting Bases and Bearing Plates: Clean concrete and masonry bearing surfaces of bond-reducing materials and roughen to improve bond to surfaces. Clean bottom surface of base and bearing plates. Set loose and attached base plates and bearing plates for structural members on wedges or other adjusting devices.
- E. Tighten anchor bolts after supported members have been positioned and plumbed. Do not remove wedges or shims, but if protruding, cut off flush with edge of base or bearing plate prior to backing with grout.
- F. Pack grout solidly between bearing surfaces and bases or plates to ensure that no voids remain. Finish exposed surfaces, protect installed materials, and allow to cure. For proprietary grout materials, comply with manufacturer's instructions.
- G. Field Assembly: Set structural frames accurately to lines and elevations indicated. Align and adjust various members forming part of complete frame or structure before permanently fastening. Clean bearing surfaces and other surfaces which will be in permanent contact before assembly. Perform necessary adjustments to compensate for discrepancies in elevations and alignment.
 - 1. Level and plumb individual members of structure within specified AISC tolerances.
 - 2. Splice members only where indicated and accepted on shop drawings.
- H. Erection Bolts: On exposed welded construction, remove erection bolts, fill holes with plug welds and grind smooth at exposed surfaces.
- I. Comply with AISC Specifications for bearing, adequacy of temporary connections, alignment, and removal of paint on surfaces adjacent to field welds. Do not enlarge unfair holes in members by burning or by use of drift pins, except in secondary bracing members. Ream holes that must be enlarged to admit bolts.
- J. Gas Cutting: Do not use gas cutting torches in field for correcting fabrication errors in primary structural framing. Cutting will be permitted only on secondary members which are not under stress, as acceptable to Architect. Finish gas-cut sections equal to a sheared appearance when permitted.

SECTION 051200 - STRUCTURAL STEEL (continued):

- K. Touch-Up Painting: Immediately after erection, clean field welds, bolted connections, and abraded areas of shop paint. Apply paint to exposed areas using same material as used for shop painting. Apply by brush or spray to provide minimum dry film thickness of 1.5 mils.

3.02 QUALITY CONTROL

- A. Engage an independent testing and inspection agency to inspect high-strength bolted connections and welded connections and to perform tests and prepare test reports. Testing agency shall conduct and interpret tests and state in each report whether test specimens comply with requirements, and specifically state any deviations therefrom. Provide access for testing agency to places where structural steel work is being fabricated or produced so that required inspection and testing can be accomplished.
- B. Shop Bolted Connections: Inspect in accordance with AISC specifications.
- C. Shop Welding: Inspect and test during fabrication of structural steel assemblies, as follows:
 - 1. Use Current Certified welders and conduct inspections and tests as required. Record types and locations of defects found in work. Record work required and performed to correct deficiencies.
 - 2. Perform visual inspection of all welds.
- D. Field Bolted Connections: Inspect in accordance with AISC specifications.
- E. Field Welding: Inspect and test during erection of structural steel as follows:
 - 1. Use Current Certified welders and conduct inspections and tests as required. Record types and locations of defects found in work. Record work required and performed to correct deficiencies.
- F. Completion Certification: Upon completion of erection, fabricator engineer shall certify that all connections have been completed in accordance with the shop drawings and contract documents.

END OF SECTION 051200

SECTION 055000 - METAL FABRICATION

PART 1 - GENERAL

- 1.01 STRUCTURAL PERFORMANCE: Provide the following assemblies capable of withstanding loadings indicated:
- A. Control of Corrosion: Prevent galvanic action and other forms of corrosion by insulating metals and other materials from direct contact with incompatible materials.
- 1.02 SUBMITTALS: In addition to product data, submit shop drawings showing details of fabrication, assembly and installation including templates for anchor bolt placement.
- A. Samples of materials and finished products as may be requested by Architect.

PART 2 - PRODUCTS

- 2.01 MATERIALS/FABRICATION: For work exposed to view use materials selected for their smoothness and freedom from surface blemishes.
- A. Steel Plates, Shapes, and Bars: ASTM A 36.
- B. Structural Steel Sheet: ASTM A 570 or ASTM A 611, Class 1; of grade required for design loading.
- C. Galvanized Structural Sheet: ASTM A 446, of grade required for design loading; coating designation G90 or as indicated.
- D. Steel Pipe: ASTM A 53, type and grade as required for design loading (if applicable), black finish unless galvanizing indicated; standard weight (Schedule 40) unless otherwise indicated. All handrails shall be 1 ½" o.d.
- E. Aluminum Pipe: Provide alloy and temper recommended by aluminum producer and finisher for type of use and finish indicated, and with not less than the strength and durability properties of alloy and temper designated below for each aluminum form required.
1. Extruded Tubing: ASTM B221, Alloy 6063-T5/T52.
 2. Extruded Structural Pipe and Round Tubing: ASTM B 429, Alloy 6063-T6. Provide standard Weight (Schedule 40) pipe, unless otherwise noted.
- F. Ladders: Manufacturer - Alaco Ladder Co.; Fixed aluminum ladder with top extensions (Model #561) and locking security door (Model #H300) or APPROVED EQUAL.
- H. Fasteners: Provide bolts, nuts, lag bolts, machine screws, wood screws, toggle bolts, masonry anchorage devices, lock washers as required for application indicated and complying with applicable Federal standards. Hot-dip galvanize fasteners for exterior applications to comply with ASTM A 153.
- 2.02 SHOP PAINTING: Apply shop primer to surface of metal fabrications except those embedded in concrete or galvanized; comply with SSPC-PA1 and requirements indicated below:
- A. Surface Preparation: Comply with SSPC-SP6 "Commercial Blast Cleaning" for exterior work, and with SSPC-SP3 "Power Tool Cleaning" for interior work.
- B. Shop Primer: Fabricator's standard, fast-curing, lead-free, "universal" primer complying with performance requirements of FS TT-P-645.

SECTION 055000 - METAL FABRICATIONS (continued):

- C. Stripe paint edges, corners, crevices, bolts, welds and sharp edges.
- 2.03 GALVANIZING: ASTM A 386 for assembled products; ASTM A 123 for rolled, pressed and forged steel shapes, plates, bars and strip 1/8" and thicker; galvanizing repair paint: MIL-P-21035 or SSPC-Paint-20.
- 2.04 FABRICATION, GENERAL: Use materials of size and thickness shown, or, if not shown, of required size, grade and thickness to produce strength and durability in finished product. Shop-paint all items not specified to be galvanized after fabrication.
 - A. Weld corners and seams continuously; grind exposed welds smooth and flush.
 - B. Form exposed connections with hairline, flush joints; use concealed fasteners where possible.
- 2.05 ROUGH HARDWARE: Furnish custom-fabricated bolts, plates, anchors, hangers, dowels, and other miscellaneous steel and iron shapes for framing and supporting and anchoring woodwork. Galvanize, unless otherwise indicated.
- 2.06 MISCELLANEOUS FRAMING AND SUPPORTS: Provide as required to complete work. Fabricate of welded construction in as large units as possible; drill and tap as required to receive hardware and similar items. Include required anchors for building into other work; spaced not more than 24" o.c.

PART 3 - EXECUTION

- 3.01 INSTALLATION: Perform cutting, drilling and fitting required for installation; set work accurately in location, alignment and elevation, measured from established lines and levels. Provide anchorage devices and fasteners where necessary for installation to other work.
- 3.02 TOUCH-UP SHOP PAINT after installation. Clean field welds, bolted connections and abraded areas, and apply same type paint as used in shop. Use galvanizing repair paint on damaged galvanized surfaces.

END OF SECTION 055000

SECTION 061000 – ROUGH CARPENTRY

PART – GENERAL

1.01 SUMMARY

A. Section Includes:

1. Framing with dimension lumber.
2. Framing with engineered wood products.
3. Shear wall panels.
4. Rooftop equipment bases and support curbs.
5. Wood blocking and nailers.
6. Wood furring.
7. Wood sleepers.
8. Plywood backing panels.

1.02 ACTION SUBMITTALS

A. Product Data: For each type of process and factory-fabricated product.

1. Include data for wood-preservative treatment from chemical treatment manufacturer and certification by treating plant that treated materials comply with requirements
2. Include data for fire-retardant treatment from chemical treatment manufacturer and certification by treating plant that treated materials comply with requirements.

1.03 INFORMATIONAL SUBMITTALS

A. Material Certificates: For dimension lumber specified to comply with minimum allowable unit stresses. Indicate species and grade selected for each use and design values approved by the ALSC Board of Review.

B. Evaluation Reports: For the following, from ICC-ES:

1. Wood-preservative-treated wood.
2. Fire-retardant-treated wood.
3. Engineered wood products.
4. Shear panels.
5. Power-driven fasteners.
6. Powder-actuated fasteners.
7. Expansion anchors.
8. Metal framing anchors.

PART 2 – PRODUCTS

2.01 WOOD PRODUCTS, GENERAL

A. Certified Wood: Materials shall be produced from wood obtained from forests certified by an FSC-accredited certification body to comply with FSC STD-01-001, "FSC Principles and Criteria for Forest Stewardship.

1. Dimension lumber framing.
2. Laminated-veneer lumber.
3. Parallel-strand lumber.
4. Prefabricated wood I-joists.

SECTION 061000 – ROUGH CARPENTRY (continued):

5. Rim boards.
 6. Miscellaneous lumber.
- B. Lumber: DOC PS 20 and applicable rules of grading agencies indicated. If no grading agency is indicated, provide lumber that complies with the applicable rules of any rules-writing agency certified by the ALSC Board of Review. Provide lumber graded by an agency certified by the ALSC Board of Review to inspect and grade lumber under the rules indicated.
1. Factory mark each piece of lumber with grade stamp of grading agency.
 2. For exposed lumber indicated to receive a stained or natural finish.
 3. Revise subparagraph below if rough lumber is acceptable for all work.
 4. Provide dressed lumber, S4S, unless otherwise indicated.
- C. Maximum Moisture Content of Lumber: **15 percent for 2-inch nominal thickness or less, 19 percent for more than 2-inch nominal thickness** unless otherwise indicated.
- D. Engineered Wood Products: Provide engineered wood products acceptable to authorities having jurisdiction and for which current model code research or evaluation reports exist that show compliance with building code in effect for Project.
1. Allowable Design Stresses: Provide engineered wood products with allowable design stresses, as published by manufacturer, that meet or exceed those indicated. Manufacturer's published values shall be determined from empirical data or by rational engineering analysis and demonstrated by comprehensive testing performed by a qualified independent testing agency.

2.02 WOOD-PRESERVATIVE-TREATED LUMBER

- A. Preservative Treatment by Pressure Process: AWP A U1; Use Category UC4a for items in contact with the ground.
1. Preservative Chemicals: Acceptable to authorities having jurisdiction and containing no arsenic or chromium.
- B. Kiln-dry lumber after treatment to a maximum moisture content of 19 percent. Do not use material that is warped or that does not comply with requirements for untreated material.
- C. Mark lumber with treatment quality mark of an inspection agency approved by the ALSC Board of Review.
- D. Application: Treat items indicated on Drawings, and the following:
1. Wood cants, nailers, curbs, equipment support bases, blocking, stripping, and similar members in connection with roofing, flashing, vapor barriers, and waterproofing.
 2. Wood sills, sleepers, blocking, furring, stripping, and similar concealed members in contact with masonry or concrete.
 3. Wood framing and furring attached directly to the interior of below-grade exterior masonry or concrete walls.
 4. Wood framing members that are less than 18 inches above the ground in crawlspaces or unexcavated areas.
 5. Wood floor plates that are installed over concrete slabs-on-grade.

SECTION 061000 – ROUGH CARPENTRY (continued):

2.03 FIRE-RETARDANT-TREATED MATERIALS

- A. General: Where fire-retardant-treated materials are indicated, use materials complying with requirements in this article, that are acceptable to authorities having jurisdiction, and with fire-test-response characteristics specified as determined by testing identical products per test method indicated by a qualified testing agency.
- B. Fire-Retardant-Treated Lumber and Plywood by Pressure Process: Products with a flame spread index of 25 or less when tested according to ASTM E 84, and with no evidence of significant progressive combustion when the test is extended an additional 20 minutes, and with the flame front not extending more than 10.5 feet beyond the centerline of the burners at any time during the test.
 - 1. Exterior Type: Treated materials shall comply with requirements specified above for fire-retardant-treated lumber and plywood by pressure process after being subjected to accelerated weathering according to ASTM D 2898. Use for exterior locations and where indicated.
 - 2. Interior Type A: Treated materials shall have a moisture content of 28 percent or less when tested according to ASTM D 3201 at 92 percent relative humidity. Use where exterior type is not indicated.
- C. Kiln-dry lumber after treatment to a maximum moisture content of 19 percent.
- D. Identify fire-retardant-treated wood with appropriate classification marking of qualified testing agency.
- E. Application: Treat items indicated on Drawings.

2.04 DIMENSION LUMBER FRAMING

- A. Non-Load-Bearing Interior Partitions: Construction or No. 2.
 - 1. Application: Interior partitions not indicated as load-bearing.
 - 2. Species:
 - a. Mixed southern pine; SPIB.
 - b. Northern species; NLGA.
 - c. Eastern softwoods; NeLMA.
 - d. Western woods; WCLIB or WWPA.
- B. Framing Other Than Non-Load-Bearing Interior Partitions: No. 2 grade.
 - 1. Application: Framing other than **interior partitions not indicated as load-bearing.**
 - 2. Species:
 - a. Hem-fir (north); NLGA.
 - b. Southern pine; SPIB.
 - c. Douglas fir-larch; WCLIB or WWPA.
 - d. Mixed southern pine; SPIB.
 - e. Spruce-pine-fir; NLGA.
 - f. Douglas fir-south; WWPA.
 - g. Hem-fir; WCLIB or WWPA.
 - h. Douglas fir-larch (north); NLGA.
 - i. Spruce-pine-fir (south); NeLMA, WCLIB, or WWPA.

SECTION 061000 – ROUGH CARPENTRY (continued):

- C. Exposed Framing: Provide material hand-selected for uniformity of appearance and freedom from characteristics, on exposed surfaces and edges, that would impair finish appearance, including decay, honeycomb, knot-holes, shake, splits, torn grain, and wane.
 - 1. Application: Exposed exterior and interior framing indicated to receive a stained or natural finish.
 - 2. Species and Grade: As indicated above for load-bearing construction of same type.

2.07 MISCELLANEOUS LUMBER

- A. General: Provide miscellaneous lumber indicated and lumber for support or attachment of other construction, including the following:
 - 1. Blocking.
 - 2. Nailers.
 - 3. Rooftop equipment bases and support curbs.
 - 4. Cants.
 - 5. Furring.
 - 6. Grounds.
- B. For items of dimension lumber size, provide Construction or No. 2 grade lumber of any species.
- C. For concealed boards, provide lumber with 19 percent maximum moisture content and any of the following species and grades:
 - 1. Mixed southern pine; No. 2 grade; SPIB.
 - 2. Eastern softwoods; No. 2 Common grade; NeLMA.
 - 3. Western woods; Construction or No. 2 Common grade; WCLIB or WWPA.

2.08 PLYWOOD BACKING PANELS

- A. Equipment Backing Panels: DOC PS 1, Exterior, AC, fire-retardant treated, in thickness indicated or, if not indicated, not less than 3/4-inch nominal thickness.
 - 1. Plywood shall comply with the testing and product requirements of the California Department of Health Services' "Standard Practice for the Testing of Volatile Organic Emissions from Various Sources Using Small-Scale Environmental Chambers."

2.09 FASTENERS

- A. General: Provide fasteners of size and type indicated that comply with requirements specified in this article for material and manufacture.
 - 1. Where rough carpentry is exposed to weather, in ground contact, or in area of high relative humidity, provide fasteners with hot-dip zinc coating complying with ASTM A 153/A 153M, use Type 304 stainless steel for pressure-preservative treated wood.
- B. Power-Driven Fasteners: NES NER-272.
- C. Bolts: Steel bolts complying with ASTM A 307, Grade A hex nuts and, where indicated, flat washers.

SECTION 061000 – ROUGH CARPENTRY (continued):

2.10 METAL FRAMING ANCHORS

- A. Manufacturers: Subject to compliance with requirements, **available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:**
- B. Basis-of-Design Product: Subject to compliance with requirements, provide **product indicated on Drawings** or comparable product by one of the following:
 - 1. Cleveland Steel Specialty Co.
 - 2. KC Metals Products, Inc.
 - 3. Phoenix Metal Products, Inc.
 - 4. Simpson Strong-Tie Co., Inc.
 - 5. USP Structural Connectors.
- C. Allowable Design Loads: Provide products with allowable design loads, as published by manufacturer, that meet or exceed those of **basis-of-design products**. Manufacturer's published values shall be determined from empirical data or by rational engineering analysis and demonstrated by comprehensive testing performed by a qualified independent testing agency.
- D. Galvanized-Steel Sheet: Hot-dip, zinc-coated steel sheet complying with ASTM A 653/A 653M, G60 coating designation.
 - 1. Use for interior locations unless otherwise indicated.
- E. Hot-Dip, Heavy-Galvanized Steel Sheet: ASTM A 653/A 653M; structural steel (SS), high-strength low-alloy steel Type A (HSLAS Type A), or high-strength low-alloy steel Type B (HSLAS Type B); G185 coating designation; and not less than 0.036 inch thick.
 - 1. Use for wood-preserved-treated lumber and where indicated.

2.11 MISCELLANEOUS MATERIALS

- A. Sill-Sealer Gaskets: Glass-fiber-resilient insulation, fabricated in strip form, for use as a sill sealer; 1-inch nominal thickness, compressible to 1/32 inch; selected from manufacturer's standard widths to suit width of sill members indicated.
- B. Sill-Sealer Gaskets: Closed-cell neoprene foam, 1/4 inch thick, selected from manufacturer's standard widths to suit width of sill members indicated.
- C. Flexible Flashing: Composite, self-adhesive, flashing product consisting of a pliable, **butyl rubber** compound, bonded to a high-density polyethylene film, aluminum foil, or spunbonded polyolefin to produce an overall thickness of not less than 0.025 inch.

PART 3 - EXECUTION

3.01 INSTALLATION, GENERAL

- A. Set rough carpentry to required levels and lines, with members plumb, true to line, cut, and fitted. Fit rough carpentry to other construction; scribe and cope as needed for accurate fit. Locate furring, nailers, blocking, and similar supports to comply with requirements for attaching other construction.

SECTION 061000 – ROUGH CARPENTRY (continued):

- B. Framing Standard: Comply with AF&PA's WCD 1, "Details for Conventional Wood Frame Construction," unless otherwise indicated.
- C. Framing with Engineered Wood Products: Install engineered wood products to comply with manufacturer's written instructions.
- D. Install fire-retardant treated plywood backing panels with classification marking of testing agency exposed to view.
- E. Shear Wall Panels: Install shear wall panels to comply with manufacturer's written instructions.
- F. Metal Framing Anchors: Install metal framing anchors to comply with manufacturer's written instructions. Install fasteners through each fastener hole.
- G. Do not splice structural members between supports unless otherwise indicated.
- H. Comply with AWWA M4 for applying field treatment to cut surfaces of preservative-treated lumber.
- I. Where wood-preservative-treated lumber is installed adjacent to metal decking, install continuous flexible flashing separator between wood and metal decking.
- J. Securely attach rough carpentry work to substrate by anchoring and fastening as indicated, complying with the following:
 - 1. NES NER-272 for power-driven fasteners.
 - 2. Table 2304.9.1, "Fastening Schedule," in ICC's International Building Code.
 - 3. Table R602.3(1), "Fastener Schedule for Structural Members," and Table R602.3(2), "Alternate Attachments," in ICC's International Residential Code for One- and Two-Family Dwellings.

3.02 PROTECTION

- A. Protect wood that has been treated with inorganic boron (SBX) from weather. If, despite protection, inorganic boron-treated wood becomes wet, apply EPA-registered borate treatment. Apply borate solution by spraying to comply with EPA-registered label.
- B. Protect rough carpentry from weather. If, despite protection, rough carpentry becomes sufficiently wet that moisture content exceeds that specified, apply EPA-registered borate treatment. Apply borate solution by spraying to comply with EPA-registered label.

END OF SECTION 061000

SECTION 066100 - SOLID SURFACE WINDOW SILLS

PART 1 – GENERAL

1.01 SUMMARY

- A. Window Sills

1.02 REFERENCES

- A. American National Standards Institute (ANSI)
- B. International Cast Polymer Alliance (ICPA)

1.03 SYSTEM DESCRIPTION

- A. Performance Requirements: Provide window sills that conform to the following requirements of regulatory agencies.
 - 1. Provide window sills that conform to ANSI/ICPA SS-1 for workmanship and finish, structural integrity and material characteristics.
 - 2. Fungal and Bacterial Resistance: Provide Solid Surface that does not support fungal or bacterial growth as tested in accordance with ASTM G-21 and ASTM G-22.

1.04 SUBMITTALS

- A. Product Data: Manufacturer's printed product data for each type of window sill specified.
- B. Samples: Color samples a minimum of 2" x 2" indicating color and pattern.
- C. Manufacturer's Installation Instruction: Printed installation instructions for each type of window sill specified.

1.05 DELIVERY, STORAGE AND HANDLING

- A. Deliver materials in unopened factory packaging to the jobsite
- B. Inspect materials at delivery to assure that specified products have been received.
- C. Store in original packaging in an interior climate controlled location away from direct sunlight.

1.06 PROJECT CONDITIONS

- A. Environmental Requirements: Products must be installed in an interior climate controlled environment.

1.07 WARRANTY

- A. Limited 10 Year Warranty against material and manufacturing defects.

PART 2 – PRODUCTS

2.01 MANUFACTURER

- A. InPro® Corporation, or approved equal.

SECTION 066100 - SOLID SURFACE WINDOW SILLS (continued)

PO Box 406 Muskego, WI 53150 USA;
Telephone: 800.222.5556, Fax: 888.715.8407,
www.inprocorp.com

- B. Provide all window sills from a single source.
- C. Contact: Joe Muskus (904)403-6755

2.02 MANUFACTURED UNITS

- A. Window Sills
 - 1. BioPrism® Solid Surface Window Sills
 - a. Provide window sills from 1/2" BioPrism® Solid Surface to size and shape as specified on the architect's drawings. Seams shall be adhesively joined and inconspicuous.

2.03 ACCESSORIES

- A. Solid Surface Bonding Adhesive
- B. Adhesive Cartridge Dispenser
- C. Adhesive Mixing Tips
- D. Silicone Sealant

2.04 MATERIALS

- A. BioPrism® Solid Surface: Window sills shall be manufactured from polyester/acrylic blended resins with natural filler material.

2.05 FINISHES

- A. Select color from InPro® Corporation BioPrism® Solid Surface color palette.

PART 3 - EXECUTION

3.01 EXAMINATION

- A. Examine areas and conditions in which window sills will be installed.

3.02 PREPARATION

- A. General: Prior to installation, clean area to remove dust, debris and loose particles.

3.03 INSTALLATION

- A. General: Install components plumb and level, scribe adjacent finishes, in accordance with approved shop drawings and recommended installation instructions.

SECTION 066100 - SOLID SURFACE WINDOW SILLS (continued)

3.04 CLEANING

- A. At completion of the installation, clean surfaces in accordance with the manufacturer's clean-up and maintenance instructions.

END OF SECTION 066100

SECTION 072100 - ACOUSTICAL INSULATION

PART 1 - GENERAL

1.01 SUMMARY

A. Section includes thermal insulation, acoustical insulation, and exterior wall insulation as indicated and/or specified complete.

1.02 Fire Performance Characteristics: Provide insulation materials identical to those whose indicated fire performance characteristics have been determined per ASTM E 119, ASTM E 84, and ASTM E 136, as applicable, by UL or other testing and inspecting organizations acceptable to authorities having jurisdiction. Identify products with appropriate markings of applicable testing and inspecting organization.

1.03 SUBMITTALS: Submit product data for each form and type of insulation indicated.

PART 2 - PRODUCTS

2.01 Acoustical Insulation:

A. Mineral fiber sound batts, R-11, unfaced (non-combustible). Flame spread - 25 maximum as tested by ASTM # 84-75.

B. Acoustical insulation is required above ceilings at toilets, unless "full height" sound insulated walls are specified. Vinyl backed insulation shall be used in open air plenum spaces. STC rating shall be 45 to 51 in walls and ceilings.

2.02 Vapor Barrier: Provide vapor barrier at all exterior wood / metal stud construction and as indicated on drawings. Vapor barrier (6 mil) shall be "DURA-SKRIM 6WW" by Raven Industries, Inc. (800) 635-3456 OR approved equal. Vapor barrier shall meet or exceed ASTM E 84 standard, Class 'A', and shall comply with the following:

A. Perm Rating: 0.07

B. Tensile Strength: 42 lbf.

C. Elongation at Break: 450%.

PART 3 - EXECUTION

3.01 GENERAL: Comply with insulation manufacturer's instructions for installation of insulation.

A. Support insulation units by adhesive or mechanical anchorage or both as applicable to location and conditions indicated.

3.02 INSTALLATION

A. Batt Insulation: Provide Batt insulation as indicated. Install insulation with edges butted snugly, leaving no open areas. Support securely with staples, clips, tape or fasteners, as required. Install in accordance with the manufacturer's directions and recommendations.

1. If no specific method is indicated, bond units to substrate with adhesive or use mechanical anchorage, to provide permanent placement and support of units.

SECTION 072100 - ACOUSTICAL INSULATION (continued):

2. Set vapor barrier faced units with vapor barrier to outside of construction, except as otherwise shown.
3. At interior ceilings, where indicated, install on top of drywall or acoustical tile, as shown, fastening securely. Do not install insulation over light fixtures. Maintain 3" clearance from all light fixtures.
4. At exterior soffits and ceilings, install on cross runners. Wire tie and fasten to prevent sag.
5. At roof place 6" batts between roof purlins supported by chicken wire mechanically fastened to purlins. Joints to be taped.

B. Wall Insulation:

1. Install as per manufacturer's specifications, using licensed and approved installers.

C. Vapor Barrier: Overlap vapor barrier 6" and tape with 4" black seaming tape as recommended by manufacturer.

END OF SECTION 07210

SECTION 072115 – COATED GLASS-MAT FACED POLYISOCYANURATE FOAM BOARD INSULATION

PART – GENERAL

1.01 SECTION INCLUDES

- A. Rigid polyisocyanurate foam board insulation with coated glass-mat facers.
- B. Fasteners, adhesives, and sealants necessary for a complete installation.

1.02 WORK SPECIFIED IN OTHER SECTIONS

- A. Division 04 Section 042000, "Unit Masonry," for masonry assemblies utilizing rigid polyisocyanurate foam board insulation.
- B. Division 05 Section 054000, "Cold Formed Metal Framing," for cold formed metal framing supported wall assemblies utilizing rigid polyisocyanurate foam board insulation.
- C. Division 07 Section 072100, "Acoustical Insulation" for requirements of acoustical insulation in conjunction with rigid polyisocyanurate foam board insulation.
- D. Division 07 Section 072119, "Foamed-In-Place Insulation" for requirements of foamed-in-place insulation in conjunction with rigid polyisocyanurate foam board insulation.
- E. Division 07 Section 079200, "Joint Sealers" for requirements of joint sealants in conjunction with rigid polyisocyanurate foam board insulation.

1.03 SUBMITTALS

- A. Make submittals in accordance with requirements specified in Division 01 Section 013300 "Submittal Procedures."
- B. Product Test Reports: Submit evaluation reports published by independent authority indicating evidence of compliance with specified criteria.
- C. Product Data: Submit product data for each type of product indicated.
- D. Samples: Submit three samples, minimum size 4 inch x 8 inch (101 mm x 203 mm).

1.04 QUALITY ASSURANCE

- A. Surface Burning Characteristics: Mark products with readily identifiable mark from recognizable testing agency indicating compliance with ASTM E84.
 - I. Flame spread 75 or less.
- B. Provide continuous insulated barrier. Extend closed cell foam board from floor to intersection of roof above. Seal/insulate at intersection of roof and wall insulation.

1.05 STORAGE AND HANDLING

- A. Comply with Manufacturer's recommendations for the proper storage and handling of insulation materials.
- B. Store materials off of ground, protected from physical damage, and covered or otherwise shielded

SECTION 072115 – COATED GLASS-MAT FACED POLYISOCYANURATE FOAM BOARD INSULATION (continued):

from sunlight.

- C. Protect insulation so that insulation does not come in direct contact with rain, snow, or other moisture sources.

PART 2 – PRODUCTS

2.01 GLASS MAT FACED POLYISOCYANURATE RIGID FOAM BOARD INSULATION

- A. Glass Mat Faced Polyisocyanurate Foam Board Insulation: High performance rigid board insulation board complying with ASTM C1289 Type II, Class 2, Grade 2 consisting of a Class A closed cell polyisocyanurate foam core laminated between a coated glass mat facer on each side of board. To be installed on interior face of CMU at perimeter walls of conditioned spaces.
 - 1. Basis of Design Product: Subject to compliance with the documents, provide Atlas Roofing Corporation "Rboard" or comparable product(s) by one of the following:
 - a. Carlisle Coatings and Waterproofing.
 - b. Hunter Panels.
 - 2. Provide glass mat faced polyisocyanurate board insulation with the following thickness and R-value **2.5 inch (64 mm) thick; R-15.3**.
 - 3. Facer Materials: coated glass mat facer on each face of board insulation.
 - 4. Flame Spread and Smoke Developed: Less than 75 and less than 450, respectively, when tested in accordance with ASTM E 84.
 - 5. Moisture Vapor Transmission: Less than 1.2 when tested in accordance with ASTM E 96, Desiccant Method.
 - 6. Compressive Strength: Meets or exceeds Type II when tested in accordance with ASTM C 1289.
 - 7. Water Absorption: Less than 1% by volume when tested in accordance with ASTM C 209.
 - 8. Dimensional Stability: Less than 1% linear change when tested in accordance with ASTM D 2126.
 - 9. Service Temperatures: -100°F to + 250°F (-73°C to +122°C)
 - 10. Auto-Ignition Temperature: 800°F

2.02 ACCESSORIES

- A. Insulation Adhesive at CMU: High strength, heavy-bodied, thermoplastic rubber adhesive formulated to bond insulation to metal, concrete or masonry surfaces.
 - 1. Product: Subject to compliance with the requirements, provide one of the following:
 - a. AGM Industries GPA-72 Adhesive.
 - b. Loctite PL 300 VOC.
 - c. BASF Sonneborn Premium Adhesive
 - d. Other products approved in writing by the board insulation manufacturer.
- B. Mechanical Fasteners at Studs: Low profile, 2 inch (50 mm) diameter high-density polypropylene washer and screw assembly designed specifically to fasten insulation board to designated substrate.
 - 1. Product: Subject to compliance with the requirements, provide one of the following.
 - a. Rodenhouse, Inc. fasteners as approved in writing by the manufacturer for the intended substrate.
 - b. Wind-Lock fasteners as approved in writing by the fastener manufacturer for the

SECTION 072115 – COATED GLASS-MAT FACED POLYISOCYANURATE FOAM BOARD INSULATION (continued):

- intended substrate.
 - c. Other products approved in writing by the board insulation manufacturer.
- C. Joint Sealant: Single component, non-shrink joint sealants and backings which are compatible with each other and other materials in the assembly.
 - I. Product: Subject to compliance with the requirements, provide one of the following:
 - a. Sikaflex-1A and 2C NS
 - b. PecoraDynotrol I & II
 - c. Sonneborn NP1 & NP
 - d. Dow 790, 791, 795
 - e. GE Silpruf, Silpruf LM
 - f. Pecora 890, 895
 - g. Loctite PL 300 Foamboard adhesive.
 - h. BASF Sonneborn Premium Adhesive.
 - i. Other joint sealant approved in writing by the Manufacturer.
- D. Expanding Foam Sealant: Single component, non-shrink, Class A polyurethane insulating foam that is compatible with board insulation board; Complies with ASTM E814 Standard Test Method for Fire Tests of Through-Penetration Fire Stops; air and vapor permeance not greater than insulating board.
 - I. Product: Subject to compliance with the requirements, provide one of the following:
 - a. Dow Great Stuff Pro Gaps & Cracks Insulating Foam Sealant.
 - b. FOMO Products, Inc.; Handi-Foam Fireblock Sealant.
 - c. Other products approved in writing by the board insulation manufacturer.
- E. Joint Tape: Self-adhering, glass fiber tape, minimum 3 inch (76 mm) wide with high temperature acrylic adhesive intended for adhesion to coated glass substrate.
 - I. Product: Subject to compliance with the requirements, provide one of the following:
 - a. IPG Cold Weather Aluminum Foil Tape.
 - b. Atlas WRB Tape.
 - c. Other products approved in writing by the board insulation manufacturer.

PART 3 - EXECUTION

3.01 EXAMINATION

- A. Inspect areas to receive insulation. Ensure that substrates intended for adhesive fastening are clean and free from moisture or other materials that may have a deleterious effect on adhesion. Prepare report identifying conditions that may be detrimental to the performance of the insulation and proceed with installation only after the conditions noted have been properly addressed.

3.02 INSTALLATION

- A. General:
 - 1. Comply with Manufacturer's instructions for installation of polyisocyanurate rigid foam board insulation.
 - 2. Do not install polyisocyanurate rigid foam board insulation that has become soiled, wet, or has not been properly protected from sunlight.

SECTION 072115 – COATED GLASS-MAT FACED POLYISOCYANURATE FOAM BOARD INSULATION (continued):

3. Dry fit polyisocyanurate rigid foam board insulation prior to final installation. Neatly trim board around conduits, pipes, and other items that will penetrate board.
4. Provide continuous sealed barrier on walls to roof insulation.

B. Adhesive Attachment at CMU:

1. Apply 3 inch diameter dabs of adhesive spaced no greater than 24 inches (610 mm) on center in both directions. At perimeter edges and at openings, apply additional continuous ribbon of adhesive no greater than 3 inches (76 mm) from edge of board or board opening.
2. Before adhesive skims over, align board and press insulation board on to substrate, applying an even, medium pressure to spread adhesive and remove air pockets.

C. Mechanical Attachment at Studs:

1. Fasten insulation board to substrate with mechanical anchors, with anchors evenly spaced no greater than 24 inches (610 mm) on center in both directions. At perimeter edges and at openings, install fasteners at maximum 24 inches (610 mm) on center, and no greater than 4 inches (101 mm) from edge of board or board opening. The washer of a single 1 ¾ inch washer style fastener may be used to bridge adjoining boards.

3.03 ACCESSORIES

- A. Joint Sealant: For joints, gaps, and openings less than ½ inch (13 mm) wide, install continuous bead of joint sealant. Provide backer rod as required to prohibit joint sealant from bonding to a third surface.
- B. Expanding Foam Sealant: For joints, gaps, and openings greater than ½ inch (13 mm) wide, install sealant in a continuous ribbon between adjacent board edges, working sealant in to joint for a full depth bead of sealant.
- C. Tape: Install tape evenly between adjacent boards in continuous pieces using longest practicable lengths. Where splices are required, provide laps no less than 6 inches (150mm).
 1. Install tape over horizontal joints with 2/3 of the tape on the insulation board above and 1/3 of the tape on the insulation board below.
 2. Continue taping vertical and horizontal seams up the building, ensuring that horizontal seams are taped first where horizontal and vertical tapes intersect.
 3. Firmly roll tape with "J" roller to displace air pockets and to ensure complete attachment of tape to board insulation boards.

3.04 PROTECTION

- A. Protect polyisocyanurate rigid foam board wall insulation from excess moisture, mechanical damage, and exposure to open flame.
- B. Promptly repair damage caused to insulation in a manner that retains integrity and continuity of insulation and facer materials.
- C. Cover insulation with cladding promptly, but no later than 180 days after installation of insulation.

END OF SECTION 072115

SECTION 072119 – FOAMED-IN-PLACE INSULATION

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including Contractual Conditions and Division 01 Specification Sections, apply to this Section. Provide minimum of R-30 sprayed-on underside of roof.

1.02 SUMMARY

- A. Section Includes: HFC 365/227-blown, closed cell, polyurethane spray foam insulation.
- B. Related Sections:
 - 1. Division 07 Section 072100 – Acoustical Insulation
 - 2. Division 07 Section 072115 – Coated Glass-Mat Faced Polyisocyanurate Foam Board Insulation
 - 3. Divisions 21 through 23 Mechanical Documents
- C. Coordinate mechanical ventilation and fresh air supply with Mechanical sections and ASHRAE Guidelines for optimum indoor air quality.
- D. Contractor is responsible for securing existing substrate materials for attachment.
- E. Provide continuous insulation system - coordinate with wall insulation.

1.03 REFERENCES

- A. American Society for Testing and Materials International (ASTM)
 - 1. ASTM C 518: Standard Test Method for Steady-State Thermal Transmission Properties by Means of the Heat Flow Meter Apparatus
 - 2. ASTM C 1338: Standard Test Method for Determining Fungi Resistance of Insulation Materials and Facings
 - 3. ASTM E 84: Test Method for Surface Burning Characteristics of Building Materials
 - 4. ASTM E 96: Standard Test Methods for Water Vapor Transmission of Materials
 - 5. ASTM E119: Standard Test Methods for Fire Tests of Building Construction and Materials
 - 6. ASTM E 2178: Standard Test Method for Air Permeance of Building Materials
 - 7. NFPA 285: Standard Fire Test Method for Evaluation of Fire Propagation Characteristics of Exterior Non Load-Bearing Wall Assemblies Containing Combustible Components

1.04 SUBMITALLS

- A. Product Data for type of insulation product specified.
- B. Product test reports performed by a qualified third-party testing agency evidencing compliance of insulation products with specified requirements including those for thermal resistance, fire-test-response characteristics, water-vapor transmission, and other properties, based on comprehensive testing of current products.
- C. Evaluation Report: Evidence of compliance of foam-plastic insulations with International Building Code (IBC), International Residential Code (IRC), International Energy Conservation Code (IECC).
- D. Manufacturer's certificate certifying insulation provided meets or exceeds specified requirements.
- E. Sample warranty.

SECTION 072119 – FOAMED-IN-PLACE INSULATION (continued):

1.05 QUALITY ASSURANCE

- A. Manufacturer’s Qualifications: Product produced in an ISO 9001 registered factory.
- B. Single Source Responsibility: Single source product from one manufacturer.
- C. Installer Qualifications: Engage an Icynene Licensed Contractor (installer) who has been trained and certified by Icynene.
- D. Fire-Test-Response Characteristics: Provide materials specified as determined by testing identical products per test method indicated below by a testing and inspecting agency acceptable to authorities having jurisdiction. Identify materials with appropriate markings of applicable testing and inspecting agency.
 - 1. Surface-Burning Characteristics: ASTM E 84
 - 2. Rated Wall Assembly Testing: ASTM E119 and NFPA 285
- E. Toxicity/Hazardous Materials
 - 1. Provide products that are “Low-emitting”.
 - 2. Provide products that contain no PBDE’s .
 - 3. Provide products that contain no urea-formaldehyde.

1.06 DELIVERY, STORAGE, AND HANDLING

- A. Comply with manufacturers written instructions for handling and protection prior to and during installation.
- B. Store both components in a temperature controlled area between 60 and 85 degrees F. Do not allow product to freeze.
- C. Use only those components that are supplied by the Manufacturer.

1.07 PROJECT CONDITIONS

- A. Do not expose to sunlight, except to extent necessary for period of installation and concealment.

1.08 WARRANTY

- A. Refer to www.Icynene.com for full warranty terms.

PART 2- PRODUCTS

2.01 MANUFACTURERS

- A. Polyurethane Spray Foam Insulation: Icynene ProSeal™ (MD-C-200v3) by Icynene Inc. or approved equal. (Foamsulate 220 and QuadFoam 2.0 closed cell spray polyurethane foam insulations by Accella Polyurethane systems is an approved equal).

2.02 MATERIALS

- A. General: Provide insulating materials that comply with requirements and with referenced standards.

SECTION 072119 – FOAMED-IN-PLACE INSULATION (continued):

- B. Icynene ProSeal™ (MD-C-200v3) Spray Foam Insulation: Medium-density, HFC 365/227 blown conforming to the following:
1. Thermal Resistance (for 1 inch of material) (R-Value/inch @75 deg F): ASTM C 518; 7.1 hr.sq ft.degree F/BTU (R-30 minimum at roof).
 2. Air Permeance (for 1 inch of material): ASTM E 2178: less than 0.02 L/s.m² @75 Pa
 3. Water Vapor Transmission (for 1.5 inches of material): ASTM E 96; 0.97 perm
 4. Resistance to Fungal Growth: ASTM C 1338: no growth
 5. Product Emissions: Collaborative for High Performance Schools (CHPS) “Low-emitting” material per CA Section 01350 criteria.
 6. Flame Spread and Smoke Developed Rating: ASTM E 84

1	Flame Spread:	25
2	Smoke Development:	300
- C. International Fireproof Technology Inc. DC-315: water-based, intumescent paint, conforming to the following:
1. Full scale fire resistance test with Icynene ProSeal (MD-C-200v3) in accordance with NFPA 286: 24 wet mils (thermal barrier).
 2. Finish: flat, grey color
 3. VOC Content: 47 g/L
 4. Volume Solids: 67%
 5. Flash Point: none
 6. Mechanism of cure: coalescence
 7. Reducer/cleaner: water
 8. Collaborative for High Performance Schools (CHPS) “Low-emitting” material per CA Section 01350 criteria.

2.03 SOURCE QUALITY CONTROL

- A. Insulation product components produced in an ISO 9001 registered factory.

PART 3 - EXECUTION

3.01 EXAMINATION

- A. After installation has been completed a representative of the hardware supplier is to inspect the installation of the finish hardware to ensure that each item of hardware is operating properly and installed according to the approved hardware schedule.

3.02 PREPARATION

- A. Clean substrates and cavities of loose materials capable of interfering with insulation placement.

3.03 APPLICATION

- A. Site mix liquid components supplied by Icynene and installed by Independent Icynene Licensed Dealer.
- B. Apply insulation to substrates in compliance with manufacturer's written instructions. Apply first pass to maximum of 3 inches. Additional passes to be 2 inches maximum.
- C. Apply insulation to produce thickness required for indicated R Value.

SECTION 072119 – FOAMED-IN-PLACE INSULATION (continued):

- D. Extend insulation in thickness indicated to envelop entire area to be insulated.
- E. Water-Piping Coordination: If water piping is located within insulated exterior walls, coordinate location of piping to ensure that it is placed on warm side of insulation and insulation encapsulates piping.
- F. Install DC-315 intumescent paint to required wet or dry mil thickness or coverage rate in accordance with manufacturer's instructions, by brush, roller, conventional or airless spray.

3.04 REPAIRS

- A. Any repairs must be effected by an Icynene Licensed Contractor.

3.05 PROTECTION

- A. Protect installed insulation from damage due to harmful weather exposures, physical abuse, and other causes. Provide temporary coverings where insulation is subject to abuse.

END OF SECTION 072119

SECTION 074113 – METAL ROOF PANELS

PART – GENERAL

1.01 SECTION INCLUDES

- A. Exposed fastener metal roof panels, with related metal trim and accessories.

Note: Provide new roof panels where existing roof penetrations are removed and new panels at ducts through the roof for the exhaust fan and cricket to match existing.

1.02 RELATED REQUIREMENTS

- A. Division 05 Section "Structural Steel" for structural steel framing supporting metal panels.
- B. Division 07 Section "Coated Glass-Mat Faced Polyisocyanurate Foam Board Insulation" for thermal insulation installed under metal panels.
- C. Division 07 Section "Metal Wall Panels" for factory-formed metal wall and soffit panels.
- D. Division 07 Section "Flashing and Sheet Metal" for formed sheet metal copings, flashings, reglets, and roof drainage items in addition to items specified in this Section.
- E. Division 07 Section "Joint Sealers" for field-applied Joint Sealants.
- F. Division 07 Section "Fluid Applied Roofing Restoration".

1.03 REFERENCES

- A. American Architectural Manufacturer's Association (AAMA): www.aamanet.org:
1. AAMA 621 - Voluntary Specifications for High Performance Organic Coatings on Coil Coated Architectural Hot Dipped Galvanized (HDG) & Zinc-Aluminum Coated Steel Substrates.
 2. AAMA 809.2 - Voluntary Specification Non-Drying Sealants.
- B. American Society of Civil Engineers (ASCE): www.asce.org/codes-standards:
1. ASCE 7 - Minimum Design Loads for Buildings and Other Structures.
- C. ASTM International (ASTM): www.astm.org:
1. ASTM A 653 - Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process.
 2. ASTM A 755 - Specification for Steel Sheet, Metallic Coated by the Hot-Dip Process and Prepainted by the Coil-Coating Process for Exterior Exposed Building Products.
 3. ASTM A 792/A 792M - Standard Specification for Steel Sheet, 55 % Aluminum-Zinc Alloy-Coated by the Hot-Dip Process.
 4. ASTM C 645 - Specification for Nonstructural Steel Framing Members.
 5. ASTM C 754 - Specification for Installation of Steel Framing Members to Receive Screw-Attached Gypsum Panel Products.
 6. ASTM C 920 - Specification for Elastomeric Joint Sealants.
 7. ASTM D 1003 - Standard Test Method for Haze and Luminous Transmittance of Transparent Plastics.
 8. ASTM D 2244 - Test Method for Calculation of Color Differences from Instrumentally Measured Color Coordinates.

SECTION 074113 – METAL ROOF PANELS (continued):

9. ASTM D 4214 - Test Methods for Evaluating Degree of Chalking of Exterior Paint Films.
 10. ASTM E 1646 - Standard Test Method for Water Penetration of Exterior Metal Roof Panel Systems by Uniform Static Air Pressure Difference.
 11. ASTM E 1680 - Standard Test Method for Rate of Air Leakage Through Exterior Metal Roof Panel Systems.
 12. ASTM E 1980 - Practice for Calculating Solar Reflectance Index of Horizontal and Low-Sloped Opaque Surfaces.
- D. FM Global (FM): www.fmglobal.com:
1. ANSI/FM 4471 - Approval Standard for Class 1 Panel Roofs.
- E. International Accreditation Service (IAS):
1. IAS AC 472 - Accreditation Criteria for Inspection Programs for Manufacturers of Metal Building Systems, Part B.
- G. Underwriters Laboratories, Inc. (UL): www.ul.com:
- A. UL 580 - Tests for Uplift Resistance of Roof Assemblies

1.04 ADMINISTRATIVE REQUIREMENTS

- A. Preinstallation Meeting: Prior to erection of framing, conduct preinstallation meeting at site attended by Owner, Architect, manufacturer's technical representative, inspection agency and related trade contractors.
1. Coordinate building framing in relation to metal panel system.
 2. Coordinate openings and penetrations of metal panel system.
 3. Coordinate work of Division 07 Sections "Roof Specialties" and "Roof Accessories" and openings and penetrations and manufacturer's accessories with installation of metal panels.

1.05 QUALITY ASSURANCE

- A. Manufacturer/Source: Provide metal roof panel assembly and accessories from a single manufacturer providing fixed-base roll forming, and accredited under IAS AC 472 Part B.
- B. Manufacturer Qualifications: Approved manufacturer listed in this Section with minimum five years experience in manufacture of similar products in successful use in similar applications.
1. Approval of Comparable Products: Submit the following in accordance with project substitution requirements, within time allowed for substitution review:
 - a. Product data, including certified independent test data indicating compliance with requirements.
 - b. Samples of each component.
 - c. Sample submittal from similar project.
 - d. Project references: Minimum of five installations not less than five years old, with Owner and Architect contact information.
 - e. Sample warranty.
 - f. IAS AC 472 certificate.
 2. Substitutions following award of contract are not allowed except as stipulated in Division 01 General Requirements.
 3. Approved manufacturers must meet separate requirements of Submittals Article.
- C. Installer Qualifications: Experienced Installer with minimum of five years experience with

SECTION 074113 – METAL ROOF PANELS (continued):

successfully completed projects of a similar nature and scope.

1. Installer's Field Supervisor: Experienced mechanic, able to communicate with Owner, Architect, and installers, supervising work on site whenever work is underway.

1.06 ACTION SUBMITTALS

- A. Product Data: Manufacturer's data sheets for specified products.
- B. Shop Drawings: Show layouts of metal panels. Include details of each condition of installation, panel profiles, and attachment to building. Provide details at a minimum scale 1-1/2-inch per foot of edge conditions, joints, fastener and sealant placement, flashings, openings, penetrations, roof accessories, lightning arresting equipment, and special details. Make distinctions between factory and field assembled work.
 1. Indicate points of supporting structure that must coordinate with metal panel system installation.
 2. Include data indicating compliance with performance requirements.
 3. Include structural data indicating compliance with requirements of authorities having jurisdiction.
- C. Samples for Initial Selection: For each exposed product specified including sealants. Provide representative color charts of manufacturer's full range of colors.
- D. Samples for Verification: Provide 12-inch- (305 mm-) long section of each metal panel profile. Provide color chip verifying color selection.

1.07 INFORMATIONAL SUBMITTALS

- A. Product Test Reports: Indicating compliance of products with requirements, witnessed by a professional engineer.
- B. Qualification Information: For Installer firm and Installer's field supervisor.
- C. IAS Accreditation Certificate: Indicating that manufacturer is accredited under provisions of IAS AC 472.
- D. Florida State Building Code Certificate.
- E. Manufacturer's Warranty: Sample copy of manufacturer's standard warranty.

1.08 CLOSEOUT SUBMITTALS

- A. Maintenance data.
- B. Manufacturer's Warranty: Executed copy of manufacturer's standard warranty.

1.09 DELIVERY, STORAGE, AND HANDLING

- A. Protect products of metal panel system during shipping, handling, and storage to prevent staining, denting, deterioration of components or other damage. Protect panels and trim bundles during shipping.

SECTION 074113 – METAL ROOF PANELS (continued):

1. Deliver, unload, store, and erect metal panel system and accessory items without misshaping panels or exposing panels to surface damage from weather or construction operations.
2. Store in accordance with Manufacturer's written instructions. Provide wood collars for stacking and handling in the field.

1.10 COORDINATION

- A. Coordinate sizes, profiles, and locations of roof curbs and other roof-mounted equipment and roof penetrations, based upon sizes of actual selected equipment.

1.11 WARRANTY

- A. Special Manufacturer's Warranty: On manufacturer's standard form, in which manufacturer agrees to repair or replace metal panel assemblies that fail within one year from date of Substantial Completion.
- B. Special Panel Finish Warranty: On Manufacturer's standard form, in which Manufacturer agrees to repair or replace metal panels that evidence deterioration of factory-applied finish within 25 years from date of Substantial Completion, including:
 1. Fluoropolymer Two-Coat System:
 - a. Color fading in excess of 5Hunter units per ASTM D 2244.
 - b. Chalking in excess of No. 8 rating per ASTM D 4214.
 - c. Failure of adhesion, peeling, checking, or cracking.

PART 2 – PRODUCTS

2.01 MANUFACTURER

- A. Basis of Design Manufacturer: MBCI Metal Roof and Wall Systems, Division of NCI Group, Inc.; Houston TX. Tel: (877)713-6224; Email: info@mbcicom.com; Web: www.mbcicom.com. OR APPROVED EQUAL.
 1. Provide basis of design product, or comparable product approved by Architect prior to bid.

2.02 PERFORMANCE REQUIREMENTS

- A. General: Provide metal roof panel system meeting performance requirements as determined by application of specified tests by a qualified testing facility on manufacturer's standard assemblies.
- B. Thermal Movements: Allow for thermal movements from variations in both ambient and internal temperatures. Accommodate movement of support structure caused by thermal expansion and contraction. Allow for deflection and design for thermal stresses caused by temperature differences from one side of the panel to the other.
- C. Structural Performance: Provide metal panel assemblies capable of withstanding the effects of indicated loads and stresses within limits and under conditions indicated:
 1. Wind Loads: Determine loads based on uniform pressure, importance factor, exposure category, and basic wind speed indicated on drawings.
 2. Deflection Limits: Withstand inward and outward wind-load design pressures in accordance with applicable building code with maximum deflection of 1/180 of the span with no

SECTION 074113 – METAL ROOF PANELS (continued):

evidence of failure.

- D. Wind Uplift Resistance: Comply with UL 580 for wind-uplift class UL-60 UL-90.
- E. Florida State Building Code Compliance: Comply with requirements of Florida State Building Code. www.floridabuilding.org/pr/pr_app_srch.aspx
- F. Air Infiltration: ASTM E 1680: Maximum 0.006 cfm/sq. ft. (0.030 L/s per sq. m) at 6.24 lbf/sq. ft. (300 Pa)] static-air-pressure difference.
- G. Water Penetration: ASTM E 1646: No uncontrolled water penetration at a static pressure of 20 lbf/sq. ft. (958 Pa).

2.03 METAL PANEL MATERIALS

- A. Aluminum-Zinc Alloy-Coated Steel Sheet: ASTM A 792/A 792M, structural quality, Grade 50, Coating Class AZ50 (Grade 340, Coating Class AZM150), prepainted by the coil-coating process per ASTM A 755/A 755M.

2.04 METAL ROOF PANELS

- A. Large Tapered-Rib-Profile, Exposed Fastener Metal Roof Panels: Structural metal roof panel consisting of formed metal sheet with trapezoidal major ribs with intermediate stiffening ribs symmetrically placed between major ribs, installed by lapping edges of adjacent panels.
 - 1. Basis of Design: MBCI, PBR Panel, www.mbc.com/pbr.html, OR APPROVED EQUAL.
 - 2. Coverage Width: 36 inches (914 mm).
 - 3. Major Rib Spacing: 12 inches (305 mm) on center.
 - 4. Rib Height: 1-1/4 inch (31.8 mm).
 - 5. Nominal Coated Thickness: 0.022 inch/26 gage (0.56 mm).
 - 6. Panel Surface: Smooth.
 - 7. Exterior Finish: Fluoropolymer two-coat system.
 - 8. Color: Match existing.

2.05 METAL ROOF PANEL ACCESSORIES

- A. General: Provide complete metal roof panel assembly incorporating ridge, eave, rake, valley, and parapet trims, copings, fascias, gutters and downspouts, and miscellaneous flashings, in manufacturer's standard profiles. Provide required fasteners, closure strips, support plates, and sealants as indicated in manufacturer's written instructions.
- B. Flashing and Trim: Match material, thickness, and finish of metal panel face sheet.
- C. Panel Fasteners: Self-tapping screws and other acceptable fasteners recommended by roof panel manufacturer.
 - 1. Exposed Fasteners: Long life fasteners with EPDM or neoprene gaskets, with heads matching color of metal panels by means of factory-applied coating.
- D. Self-Adhering, High-Temperature Underlayment: Self-adhering, cold-applied sheet underlayment, minimum 30 mils (0.76 mm), recommended by metal panel manufacturer for application. Provide primer when recommended by underlayment manufacturer.
- E. Joint Sealers: Manufacturer's standard or recommended liquid and preformed sealers and tapes, and as

SECTION 074113 – METAL ROOF PANELS (continued):

follows:

1. Tape Sealers: Manufacturer's standard non-curing butyl tape, AAMA 809.2.
 2. Concealed Joint Sealants: Non-curing butyl, AAMA 809.2.
 3. Exposed Joint Sealants: Urethane, single component, ASTM C 920.
- F. Steel Sheet Miscellaneous Framing Components: ASTM C 645, with ASTM A 653/A 653M, G60 (Z180) hot-dip galvanized zinc coating.
- G. Roof Accessories: Approved by metal roof panel manufacturer. Refer to Section 07 72 00 "Roof Accessories" for requirements for curbs, equipment supports, roof hatches, heat and smoke vents, ventilators, and preformed flashing sleeves.

2.06 FABRICATION

- A. General: Provide factory fabricated and finished metal panels and accessories meeting performance requirements, indicated profiles, and structural requirements.
- B. Panel Lengths: Form panels in continuous lengths for full length of detailed runs, except where otherwise indicated on approved shop drawings.
- C. Sheet Metal Flashing and Trim: Fabricate flashing and trim to comply with manufacturer's written instructions, approved shop drawings, and project drawings. Form from materials matching metal panel substrate and finish.

2.07 FINISHES

- A. Finishes, General: Prepare, pretreat, and apply coating to exposed metal surfaces to comply with coating and resin manufacturers' written instructions.
- B. Fluoropolymer Two-Coat System: 0.2 – 0.3 mil primer with 0.7 - 0.8 mil 70 percent PVDF fluoropolymer color coat, AAMA 621.
- C. Interior Finish: 0.5 mil total dry film thickness consisting of primer coat and wash coat of manufacturer's standard light-colored acrylic or polyester backer finish.

PART 3 - EXECUTION

3.01 EXAMINATION

- A. Examine metal panel system substrate and supports with Installer present. Inspect for erection tolerances and other conditions that would adversely affect installation of metal panel installation.
1. Inspect metal panel support substrate to determine if support components are installed as indicated on approved shop drawings. Confirm presence of acceptable supports at recommended spacing to match installation requirements of metal panels.
 2. Panel Support Tolerances: Confirm that panel supports are within tolerances acceptable to metal panel system manufacturer but not greater than the following:
 - a. 1/4 inch (6 mm) in 20 foot (6.1 m) in any direction.
 - b. 3/8 inch (9 mm) over any single roof plane.
- B. Correct out-of-tolerance work and other deficient conditions prior to proceeding with metal roof panel system installation.

SECTION 074113 – METAL ROOF PANELS (continued):

3.02 PREPARATION

- A. Miscellaneous Supports: Install subframing, girts, furring, and other miscellaneous panel support members according to ASTM C 754 and manufacturer's written instructions.
- B. Flashings: Install flashings to cover exposed underlayment per Section 076200 "Flashing and Sheet Metal".

3.03 METAL PANEL INSTALLATION

- A. Exposed Fastener Metal Roof Panels: Install weathertight metal panel system in accordance with manufacturer's written instructions, approved shop drawings, and project drawings. Install metal roof panels in orientation, sizes, and locations indicated, free of waves, warps, buckles, fastening stresses, and distortions. Anchor panels and other components securely in place. Provide for thermal and structural movement.
- B. Panel Sealants: Install manufacturer's recommended tape sealant at panel sidelaps and endlaps.
- C. Panel Fastening: Attach panels to supports using screws, fasteners, and sealants recommended by manufacturer and indicated on approved shop drawings.
 - 1. Fasten metal panels to supports at each location indicated on approved shop drawings, with spacing and fasteners recommended by manufacturer.
 - 2. Provide weatherproof jacks for pipe and conduit penetrating metal panels of types recommended by manufacturer.
 - 3. Dissimilar Materials: Where elements of metal panel system will come into contact with dissimilar materials, treat faces and edges in contact with dissimilar materials as recommended by manufacturer.

3.04 ACCESSORY INSTALLATION

- A. General: Install metal panel trim, flashing, and accessories using recommended fasteners and joint sealers, with positive anchorage to building, and with weather tight mounting. Coordinate installation with flashings and other components.
 - 1. Install components required for a complete metal panel assembly, including trim, copings, flashings, sealants, closure strips, and similar items.
 - 2. Comply with details of assemblies utilized to establish compliance with performance requirements and manufacturer's written installation instructions.
 - 3. Set units true to line and level as indicated. Install work with laps, joints, and seams that will be permanently weather resistant.
- B. Joint Sealers: Install joint sealers where indicated and where required for weathertight performance of metal panel assemblies, in accordance with manufacturer's written instructions.
 - 1. Prepare joints and apply sealants per requirements of Division 07 Section "Joint Sealers."

3.05 CLEANING AND PROTECTION

- A. Remove temporary protective films immediately in accordance with metal roof panel manufacturer's instructions. Clean finished surfaces as recommended by metal roof panel manufacturer.

SECTION 074113 – METAL ROOF PANELS (continued):

- B. Replace damaged panels and accessories that cannot be repaired to the satisfaction of the Architect.

END OF SECTION 074113

SECTION 074213 – METAL WALL PANELS

PART – GENERAL

1.01 SECTION INCLUDES

- A. Exposed fastener metal wall panels, with related metal trim and accessories.

Note: Provide new wall/fascia panels where existing penetrations are removed to match existing.

1.02 RELATED REQUIREMENTS

- A. Division 05 Section "Structural Steel" for structural steel framing supporting metal panels.
- B. Division 07 Section "Coated Glass-Mat Faced Polyisocyanurate Foam Board Insulation" for thermal insulation installed under metal panels.
- C. Division 07 Section "Metal Roof Panels" for factory-formed metal roof panels.
- D. Division 07 Section "Flashing and Sheet Metal" for formed sheet metal copings, flashings, reglets, and roof drainage items in addition to items specified in this Section.
- E. Division 07 Section "Joint Sealers" for field-applied Joint Sealants.
- F. Division 07 Section "Metal Wall Panel Restoration Paint".

1.03 REFERENCES

- A. American Architectural Manufacturer's Association (AAMA): www.aamanet.org:
1. AAMA 621 - Voluntary Specifications for High Performance Organic Coatings on Coil Coated Architectural Hot Dipped Galvanized (HDG) & Zinc-Aluminum Coated Steel Substrates.
 2. AAMA 809.2 - Voluntary Specification Non-Drying Sealants.
- B. American Society of Civil Engineers (ASCE): www.asce.org/codes-standards:
1. ASCE 7 - Minimum Design Loads for Buildings and Other Structures.
- C. ASTM International (ASTM): www.astm.org:
1. ASTM A 653 - Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process.
 2. ASTM A 755 - Specification for Steel Sheet, Metallic Coated by the Hot-Dip Process and Prepainted by the Coil-Coating Process for Exterior Exposed Building Products.
 3. ASTM A 792/A 792M - Standard Specification for Steel Sheet, 55 % Aluminum-Zinc Alloy-Coated by the Hot-Dip Process.
 4. ASTM C 645 - Specification for Nonstructural Steel Framing Members.
 5. ASTM C 754 - Specification for Installation of Steel Framing Members to Receive Screw-Attached Gypsum Panel Products.
 6. ASTM C 920 - Specification for Elastomeric Joint Sealants.
 7. ASTM D 1003 - Standard Test Method for Haze and Luminous Transmittance of Transparent Plastics.
 8. ASTM D 2244 - Test Method for Calculation of Color Differences from Instrumentally Measured Color Coordinates.
 9. ASTM D 4214 - Test Methods for Evaluating Degree of Chalking of Exterior Paint Films.

SECTION 074213 – METAL WALL PANELS (continued):

- D. International Accreditation Service (IAS):

1.04 ADMINISTRATIVE REQUIREMENTS

- A. Preinstallation Meeting: Prior to erection of framing, conduct preinstallation meeting at site attended by Owner, Architect, manufacturer's technical representative, inspection agency and related trade contractors.
1. Coordinate building framing in relation to metal panel system.
 2. Coordinate openings and penetrations of metal panel system.

1.05 QUALITY ASSURANCE

- A. Manufacturer/Source: Provide metal panel assembly and accessories from a single manufacturer providing fixed-base roll forming, and accredited under IAS AC 472 Part B.
- B. Manufacturer Qualifications: Approved manufacturer listed in this Section with minimum five years experience in manufacture of similar products in successful use in similar applications.
1. Approval of Comparable Products: Submit the following in accordance with project substitution requirements, within time allowed for substitution review:
 - a. Product data, including certified independent test data indicating compliance with requirements.
 - b. Samples of each component.
 - c. Sample submittal from similar project.
 - d. Project references: Minimum of five installations not less than five years old, with Owner and Architect contact information.
 - e. Sample warranty.
 - f. IAS AC 472 certificate.
 2. Substitutions following award of contract are not allowed except as stipulated in Division 01 General Requirements.
 3. Approved manufacturers must meet separate requirements of Submittals Article.
- C. Installer Qualifications: Experienced Installer with minimum of five years experience with successfully completed projects of a similar nature and scope.
1. Installer's Field Supervisor: Experienced mechanic, able to communicate with Owner, Architect, and installers, supervising work on site whenever work is underway.

1.06 ACTION SUBMITTALS

- A. Product Data: Manufacturer's data sheets for specified products.
- B. Shop Drawings: Show layouts of metal panels. Include details of each condition of installation, panel profiles, and attachment to building. Provide details at a minimum scale 1-1/2-inch per foot of edge conditions, joints, fastener and sealant placement, flashings, openings, penetrations, and special details. Make distinctions between factory and field assembled work.
1. Indicate points of supporting structure that must coordinate with metal panel system installation.
 2. Include data indicating compliance with performance requirements.
 3. Include structural data indicating compliance with requirements of authorities having

SECTION 074213 – METAL WALL PANELS (continued):

jurisdiction.

- C. Samples for Initial Selection: For each exposed product specified including sealants. Provide representative color charts of manufacturer's full range of colors.
- D. Samples for Verification: Provide 12-inch- (305 mm-) long section of each metal panel profile. Provide color chip verifying color selection.

1.07 INFORMATIONAL SUBMITTALS

- A. Product Test Reports: Indicating compliance of products with requirements, witnessed by a professional engineer.
- B. Qualification Information: For Installer firm and Installer's field supervisor.
- C. IAS Accreditation Certificate: Indicating that manufacturer is accredited under provisions of IAS AC 472.
- D. Florida State Building Code Certificate.
- E. Manufacturer's Warranty: Sample copy of manufacturer's standard warranty.

1.08 CLOSEOUT SUBMITTALS

- A. Maintenance data.
- B. Manufacturer's Warranty: Executed copy of manufacturer's standard warranty.

1.09 DELIVERY, STORAGE, AND HANDLING

- A. Protect products of metal panel system during shipping, handling, and storage to prevent staining, denting, deterioration of components or other damage. Protect panels and trim bundles during shipping.
 - 1. Deliver, unload, store, and erect metal panel system and accessory items without misshaping panels or exposing panels to surface damage from weather or construction operations.
 - 2. Store in accordance with Manufacturer's written instructions. Provide wood collars for stacking and handling in the field.

1.10 WARRANTY

- A. Special Manufacturer's Warranty: On manufacturer's standard form, in which manufacturer agrees to repair or replace metal panel assemblies that fail in materials and workmanship within one year from date of Substantial Completion.
- B. Special Panel Finish Warranty: On Manufacturer's standard form, in which Manufacturer agrees to repair or replace metal panels that evidence deterioration of factory-applied finish within [25] years from date of Substantial Completion, including:
 - 1. Fluoropolymer Two- Coat System:
 - a. Color fading in excess of 5 Hunter units per ASTM D 2244.
 - b. Chalking in excess of No. 8 rating per ASTM D 4214.
 - c. Failure of adhesion, peeling, checking, or cracking.

SECTION 074213 – METAL WALL PANELS (continued):

PART 2 – PRODUCTS

2.01 MANUFACTURER

- A. Basis of Design Manufacturer: MBCI Metal Roof and Wall Systems, Division of NCI Group, Inc.; Houston TX. Tel: (877)713-6224; Email: info@mbsci.com; Web: www.mbsci.com. OR APPROVED EQUAL.

1. Provide basis of design product, or comparable product approved by Architect prior to bid.

2.02 PERFORMANCE REQUIREMENTS

- A. General: Provide metal wall panel system meeting performance requirements as determined by application of specified tests by a qualified testing facility on manufacturer's standard assemblies.
- B. Thermal Movements: Allow for thermal movements from variations in both ambient and internal temperatures. Accommodate movement of support structure caused by thermal expansion and contraction. Allow for deflection and design for thermal stresses caused by temperature differences from one side of the panel to the other.
- C. Structural Performance: Provide metal panel assemblies capable of withstanding the effects of indicated loads and stresses within limits and under conditions indicated:
1. Wind Loads: Determine loads based on uniform pressure, importance factor, exposure category, and basic wind speed indicated on drawings.
2. Deflection Limits: Withstand inward and outward wind-load design pressures in accordance with applicable building code with maximum deflection of 1/180 of the span with no evidence of failure.
- D. Florida State Building Code Compliance: Comply with requirements of Florida State Building Code, www.floridabuilding.org/pr/pr_app_srch.aspx
- E. Air Infiltration: ASTM E 1680: Maximum 0.006 cfm/sq. ft. (0.030 L/s per sq. m) at 6.24 lbf/sq. ft. (300 Pa) static-air-pressure difference.
- F. Water Penetration: ASTM E 1646: No uncontrolled water penetration at a static pressure of 20 lbf/sq. ft. (958 Pa).

2.03 METAL PANEL MATERIALS

- A. Aluminum-Zinc Alloy-Coated Steel Sheet: ASTM A 792/A 792M, structural quality, Grade 50, Coating Class AZ50 (Grade 340, Coating Class AZM150), prepainted by the coil-coating process per ASTM A 755/A 755M.

2.04 METAL WALL PANELS

- A. Large Tapered-Rib-Profile, Exposed Fastener Metal Panels: Match existing. Structural metal panel consisting of formed metal sheet with trapezoidal major ribs with intermediate stiffening ribs symmetrically placed between major ribs, installed by lapping edges of adjacent panels.

SECTION 074213 – METAL WALL PANELS (continued):

1. Basis of Design: MBCI, PBR Panel, www.mbc.com/pbr.html.
2. Coverage Width: 36 inches (914 mm).
3. Major Rib Spacing: 12 inches (305 mm) on center.
4. Rib Height: 1-1/4 inch (31.8 mm).
5. Nominal Coated Thickness: 26 gage.
6. Panel Surface: Smooth.
7. Exterior Finish: [Modified silicone-polyester two-coat system.
8. Color: Match existing.

2.05 METAL PANEL ACCESSORIES

- A. General: Provide complete metal panel assembly incorporating base, corner, and opening trims and miscellaneous flashings, in [manufacturer's standard profiles] [profiles as indicated]. Provide required fasteners, closure strips, support plates, and sealants as indicated in manufacturer's written instructions.
- B. Flashing and Trim: Match material, thickness, and finish of metal panel face sheet.
- C. Panel Fasteners: Self-tapping screws and other acceptable fasteners recommended by metal panel manufacturer.
 1. Exposed Fasteners: Long life fasteners with EPDM or neoprene gaskets, with heads matching color of metal panels by means of factory-applied coating.
- D. Joint Sealers: Manufacturer's standard or recommended liquid and preformed sealers and tapes, and as follows:
 1. Tape Sealers: Manufacturer's standard non-curing butyl tape, AAMA 809.2.
- E. Steel Sheet Miscellaneous Framing Components: ASTM C 645, with ASTM A 653/A 653M, G60 (Z180) hot-dip galvanized zinc coating.

2.06 FABRICATION

- A. General: Provide factory fabricated and finished metal panels and accessories meeting performance requirements, indicated profiles, and structural requirements.
- B. Panel Lengths: Form panels in continuous lengths for full length of detailed runs, except where otherwise indicated on approved shop drawings.
- C. Sheet Metal Flashing and Trim: Fabricate flashing and trim to comply with manufacturer's written instructions, approved shop drawings, and project drawings. Form from materials matching metal panel substrate and finish.

2.07 FINISHES

- A. Finishes, General: Prepare, pretreat, and apply coating to exposed metal surfaces to comply with coating and resin manufacturers' written instructions.
- B. Fluoropolymer Two-Coat System: 0.2 – 0.3 mil primer with 0.7 - 0.8 mil 70 percent PVDF fluoropolymer color coat, (match existing) AAMA 621.
- C. Interior Finish: 0.5 mil total dry film thickness consisting of primer coat and wash coat of manufacturer's standard light-colored acrylic or polyester backer finish.

SECTION 074213 – METAL WALL PANELS (continued):

PART 3 - EXECUTION

3.01 EXAMINATION

- A. Examine metal panel system substrate and supports with Installer present. Inspect for erection tolerances and other conditions that would adversely affect installation of metal panel installation.
 - 1. Inspect metal panel support substrate to determine if support components are installed as indicated on approved shop drawings. Confirm presence of acceptable supports at recommended spacing to match installation requirements of metal panels.
 - 2. Panel Support Tolerances: Confirm that panel supports are within tolerances acceptable to metal panel system manufacturer but not greater than the following:
 - a. 1/4 inch (6 mm) in 20 foot (6.1 m) in any direction.
- B. Correct out-of-tolerance work and other deficient conditions prior to proceeding with metal panel system installation.

3.02 PREPARATION

- A. Miscellaneous Supports: Install subframing, girts, furring, and other miscellaneous panel support members according to ASTM C 754 and manufacturer's written instructions.
- B. Flashings: Install flashings to cover exposed underlayment per Section 076200 "Flashing and Sheet Metal."

3.03 METAL PANEL INSTALLATION

- A. Exposed Fastener Metal Wall Panels: Install weathertight metal panel system in accordance with manufacturer's written instructions, approved shop drawings, and project drawings. Install metal panels in orientation, sizes, and locations indicated, free of waves, warps, buckles, fastening stresses, and distortions. Anchor panels and other components securely in place. Provide for thermal and structural movement.
- B. Panel Sealants: Install manufacturer's recommended tape sealant at panel sidelaps and endlaps.
- C. Panel Fastening: Attach panels to supports using screws, fasteners, and sealants recommended by manufacturer and indicated on approved shop drawings.
 - 1. Fasten metal panels to supports at each location indicated on approved shop drawings, with spacing and fasteners recommended by manufacturer.
 - 2. Provide weatherproof jacks for pipe and conduit penetrating metal panels of types recommended by manufacturer.
 - 3. Dissimilar Materials: Where elements of metal panel system will come into contact with dissimilar materials, treat faces and edges in contact with dissimilar materials as recommended by manufacturer.

3.04 ACCESSORY INSTALLATION

- A. General: Install metal panel trim, flashing, and accessories using recommended fasteners and joint sealers, with positive anchorage to building, and with weather tight mounting. Coordinate installation

SECTION 074213 – METAL WALL PANELS (continued):

with flashings and other components.

1. Install components required for a complete metal panel assembly, including trim, copings, flashings, sealants, closure strips, and similar items.
2. Comply with details of assemblies utilized to establish compliance with performance requirements and manufacturer's written installation instructions.
3. Set units true to line and level as indicated. Install work with laps, joints, and seams that will be permanently weather resistant.

B. Joint Sealers: Install joint sealers where indicated and where required for weathertight performance of metal panel assemblies, in accordance with manufacturer's written instructions.

1. Prepare joints and apply sealants per requirements of Division 07 Section "Joint Sealers."

3.05 CLEANING AND PROTECTION

- A. Remove temporary protective films immediately in accordance with metal panel manufacturer's instructions. Clean finished surfaces as recommended by metal panel manufacturer.
- B. Replace damaged panels and accessories that cannot be repaired to the satisfaction of the Architect.

END OF SECTION 074213

SECTION 075630 – FLUID APPLIED ROOFING RESTORATION (ALTERNATE)

PART – GENERAL

1.01 SECTION INCLUDES

- A. Metal Surface Roof Restoration (1.4.B)(2.3)

1.02 RELATED SECTIONS

- 1. Section 061000 - Rough Carpentry: Roof blocking installation and requirements.
- 2. Section 076200 - Flashing and Sheet Metal: Metal cap flashing and expansion joints.
- 3. Section 076200 - Flashing and Sheet Metal: Weather protection for base flashings.
- 4. Section 077140 – Metal Gutters and Downspouts: Counter flashing gravel stops, and fascia, scuppers, gutters and downspouts.
- 5. Division 22 - Plumbing: Piping vents and roof drains.

1.03 REFERENCES

- A. ASTM C 920 - Standard Specification for Elastomeric Joint Sealants.
- B. ASTM C 1250 - Standard Test Method for Nonvolatile Content of Cold Liquid-Applied Elastomeric Waterproofing Membranes.
- C. ASTM D 1002 - Standard Test Method for Apparent Shear Strength of Single-Lap-Joint Adhesively Bonded Metal Specimens by Tension Loading (Metal-to-Metal).
- D. ASTM D 3960 - Standard Practice for Determining Volatile Organic Compound (VOC) Content of Paints and Related Coatings.
- E. SRI - Solar Reflectance Index calculated according to ASTM E 1980.
- F. National Roofing Contractors Association (NRCA) - Roofing and Waterproofing Manual.

1.04 SYSTEM DESCRIPTION

A. OVERVIEW

- 1. CPR Coating is a synthetic liquid rubber membrane specifically formulated for use on metal roofs and metal walls with unusual geometric designs. CPR White can easily be applied over sloped, contoured surfaces and will provide long-lasting, waterproof protection.
- 2. The CPR White Coating system cures to a monolithic rubbery membrane with high tensile strength, and the ability to elongate and recover when the cured CPR White Coating system is firmly adhered to the substrate. CPR White also has the ability to “bridge” hairline cracks that may develop, while maintaining performance as a continuous waterproofing membrane.

B. PHYSICAL PROPERTIES

- 1. Coatings:
 - a. Coating: CPR White: Highly reflective multi- purpose, single-component solvent based SEBS, liquid waterproofing membrane.

SECTION 075630 – FLUID APPLIED ROOFING RESTORATION (ALTERNATE) (continued):

- 1) Tensile Strength: ASTM D 412, 200 psi
 - 2) Elongation: ASTM D 412, 200%
 - 3) Density @ 77 degrees F (25 degrees C, ASTM D 1475) 9.0 lb./gal
 - 4) Flash Point: ASTM D 93, 105 degrees F min. (40.6 degrees C)
 - 5) Non-Volatile: ASTM D 1644, Typical 75%
 - 6) VOC: 430 g/l
 - 7) Reflectance: 0.77
 - 8) Emittance: 0.86
 - 9) SRI: 95
- b. Coating: CPR Base Coat: Multi- purpose, single-component solvent based SEBS, liquid waterproofing membrane.
- 1) Tensile Strength: ASTM D 412, 200 psi
 - 2) Elongation: ASTM D 412, 200%
 - 3) Density @ 77 degrees F (25 degrees C, ASTM D 1475) 9.0 lb./gal
 - 4) Flash Point: ASTM D 93, 105 degrees F min. (40.6 degrees C)
 - 5) Non-Volatile: ASTM D 1644, Typical 75%
 - 6) VOC: 400 g/l
- c. Coating: CPR Seam Sealer BG: Brush grade multi- purpose, single-component solvent based SEBS, liquid waterproofing sealer for details on a metal roof system.
- 1) Tensile Strength: ASTM D 412, 200 psi
 - 2) Elongation: ASTM D 412, 200%
 - 3) Density @ 77 degrees F (25 degrees C, ASTM D 1475) 9.12 lb./gal
 - 4) Flash Point: ASTM D 93, 105 degrees F min. (40.6 degrees C)
 - 5) Non-Volatile: ASTM D 1644, Typical 75%
 - 6) VOC: 420 g/l
- d. Coating: CPR Seam Sealer TG: Trowel grade multi- purpose, single-component solvent based SEBS, liquid waterproofing sealer for details on a metal roof system.
- 1) Tensile Strength: ASTM D 412, 600 psi
 - 2) Elongation: ASTM D 412, 400%
 - 3) Density @ 77 degrees F (25 degrees C, ASTM D 1475) 8.9 lb./gal
 - 4) Flash Point: ASTM D 93, 105 degrees F min. (40.6 degrees C)
 - 5) Non-Volatile: ASTM D 1644, Typical 60%
 - 6) VOC: 300 g/l

1.05 SUBMITTALS

- A. Submit under provisions of Section 013300.
- 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.
- C. Manufacturer's Certificates: Certify products meet or exceed specified requirements.
- D. Closeout Submittals: Provide manufacturer's maintenance instructions that include recommendations for periodic inspection and maintenance of all completed roofing work. Provide product warranty executed by the manufacturer. Assist Owner in preparation and submittal of roof installation acceptance certification as may be necessary in connection with fire and extended coverage insurance on roofing and associated work.

SECTION 075630 – FLUID APPLIED ROOFING RESTORATION (ALTERNATE) (continued):

1.06 QUALITY ASSURANCE

- A. Perform Work in accordance with NRCA Roofing and Waterproofing Manual.
- B. Manufacturer Qualifications: Manufacturer: Company specializing in manufacturing products specified in this section with documented ISO 9001 certification and minimum twelve years and experience.
- C. Installer Qualifications: Company specializing in performing Work of this section with minimum five years documented experience and a certified Pre-Approved Garland Contractor.
- D. Installer's Field Supervision: Maintain a full-time Supervisor/Foreman on job site during all phases of roofing work while roofing work is in progress.
- E. Product Certification: Provide manufacturer's certification that materials are manufactured in the United States and conform to requirements specified herein, are chemically and physically compatible with each other, and are suitable for inclusion within the total roof system specified herein.
- F. Source Limitations: Obtain all components of roof system from a single manufacturer. Secondary products that are required shall be recommended and approved in writing by the roofing system Manufacturer. Upon request of the Architect or Owner, submit Manufacturer's written approval of secondary components in list form, signed by an authorized agent of the Manufacturer.

1.07 PRE-INSTALLATION CONFERENCE

- A. Convene a pre-roofing conference approximately two weeks before scheduled commencement of roofing system installation and associated work.
- B. Require attendance of installers of deck or substrate construction to receive roofing, installers of rooftop units and other work in and around roofing which must precede or follow roofing work including mechanical work, Architect, Owner, roofing system manufacturer's representative.
- C. Objectives include:
 - 1. Review foreseeable methods and procedures related to roofing work, including set up and mobilization areas for stored material and work area.
 - 2. Tour representative areas of roofing substrates, inspect and discuss condition of substrate, roof drains, curbs, penetrations and other preparatory work.
 - 3. Review structural loading limitations of deck and inspect deck for loss of flatness and for required attachment.
 - 4. Review roofing system requirements, Drawings, Specifications and other Contract Documents.
 - 5. Review and finalize schedule related to roofing work and verify availability of materials, installer's personnel, equipment and facilities needed to make progress and avoid delays.
 - 6. Review required inspection, testing, certifying procedures.
 - 7. Review weather and forecasted weather conditions and procedures for coping with unfavorable conditions, including possibility of temporary roofing.
 - 8. Record conference including decisions and agreements reached. Furnish a copy of records to each party attending.

1.08 DELIVERY, STORAGE, AND HANDLING

- A. Deliver and store products in manufacturer's unopened packaging with labels intact until ready for

SECTION 075630 – FLUID APPLIED ROOFING RESTORATION (ALTERNATE) (continued):

installation.

- B. Store all roofing materials in a dry place, on pallets or raised platforms, out of direct exposure to the elements until time of application. Store materials at least 4 inches above ground level and covered with "breathable" tarpaulins.
- C. Stored in accordance with the instructions of the manufacturer prior to their application or installation. Store roll goods on end on a clean flat surface. No wet or damaged materials will be used in the application.
- D. Store at room temperature wherever possible, until immediately prior to installing the roll. During winter, store materials in a heated location with a 50 degree F (10 degree C) minimum temperature, removed only as needed for immediate use. Keep materials away from open flame or welding sparks.
- E. Avoid stockpiling of materials on roofs without first obtaining acceptance from the Architect/Engineer.
- F. Adhesive storage shall be between the range of above 50 degree F (10 degree C) and below 80 degree F (27 degree C). Area of storage shall be constructed for flammable storage.

1.09 PROJECT CONDITIONS

- A. Maintain environmental conditions (temperature, humidity, and ventilation) within limits recommended by manufacturer for optimum results. Do not install products under environmental conditions outside manufacturer's absolute limits.
- B. Weather Condition Limitations: Do not apply roofing system during inclement weather or when a 40 percent chance of precipitation or greater is expected.
- C. Proceed with roofing work only when existing and forecasted weather conditions will permit unit of work to be installed in accordance with manufacturer's recommendations and warranty requirements.
- D. Do not expose materials vulnerable to water or sun damage in quantities greater than can be weatherproofed during same day.
- E. When applying materials with spray equipment, take precautions to prevent over spray and/or solvents from damaging or defacing surrounding walls, building surfaces, vehicles or other property. Care should be taken to do the following:
 - 1. Close air intakes into the building.
 - 2. Have a dry chemical fire extinguisher available at the jobsite.
 - 3. Post and enforce "No Smoking" signs.
- F. Avoid inhaling spray mist; take precautions to ensure adequate ventilation.
- G. Protect completed roof sections from foot traffic for a period of at least 48 hours at 75 degrees F (24 degrees C) and 50 percent relative humidity or until fully cured.
- H. Take precautions to ensure that materials do not freeze.
- I. Minimum temperature for application is 40 degrees F (4 degrees C) and rising for solvent based materials and 50 degrees F (10 degrees C) and rising for water based.

SECTION 075630 – FLUID APPLIED ROOFING RESTORATION (ALTERNATE) (continued):

1.10 WARRANTY

- A. Upon completion of the work, provide the Manufacturer's written and signed limited labor and materials Warranty, warranting that, if a leak develops in the roof during the term of this warranty, due either to defective material or defective workmanship by the installing contractor, the manufacturer shall provide the Owner, at the Manufacturer's expense, with the labor and material necessary to return the defective area to a watertight condition.
 - 1. Warranty Period:
 - a. 5 plus 5 (10 years): 5 years from date of acceptance plus 5 additional years after required inspection by Garland.
- B. Installer is to guarantee all work against defects in materials and workmanship for a period indicated following final acceptance of the Work.
 - 1. Warranty Period:
 - a. 2 years from date of acceptance.

PART 2 – PRODUCTS

2.01 MANUFACTURERS

- A. Acceptable Manufacturer: Garland Company, Inc., which is located at: 3800 E. 91st St.; Cleveland, OH 44105; Toll Free Tel: 800-321-9336; Tel: 216-641-7500; Fax: 216-641-0633 Web:www.garlandco.com OR APPROVED EQUAL.
- B. Requests for substitutions will be considered in accordance with provisions of Section 012500. Silicone based systems are not acceptable.

2.02 ROOF RESTORATION SYSTEM FOR METAL SURFACE ROOFS

- A. Cold Applied CPR System:
 - 1. Primer: Rust-Go Primer (applied on rust only);
 - 2. Coating: CPR Base Coat/ CPR White;
 - 3. Flashing: CPR Seam Sealer on seams and penetrations.
 - 4. Surfacing: None

2.03 EDGE TREATMENT AND ROOF PENETRATION FLASHINGS

- A. Flashing Boot - Rubbertite Flashing Boot: Neoprene pipe boot for sealing single or multiple pipe penetrations adhered in approved adhesives as recommended and furnished by the membrane manufacturer.
- B. Liquid Flashing - Tuff-Flash: An asphaltic-polyurethane, low odor, liquid flashing material designed for specialized details unable to be waterproofed with typical modified membrane flashings.
 - 1. Tensile Strength, ASTM D 412: 400 psi
 - 2. Elongation, ASTM D 412: 300%
 - 3. Density @77 degrees F 8.5 lb/gal typical
- C. Fabricated Flashings: Fabricated flashings and trim are specified in Section 076200.

SECTION 075630 – FLUID APPLIED ROOFING RESTORATION (ALTERNATE) (continued):

1. Fabricated flashings and trim shall conform to the detail requirements of SMACNA "Architectural Sheet Metal Manual".

PART 3 - EXECUTION

3.01 EXAMINATION

- A. Do not begin installation until substrates have been properly prepared.
- B. Verify that work penetrating the roof deck, or which may otherwise affect the roofing, has been properly completed.
- C. If substrate preparation is the responsibility of another installer, notify Architect of unsatisfactory preparation before proceeding.

3.02 INSTALLATION

A. General Installation Requirements:

1. Install in accordance with manufacturer's instructions. Apply to minimum coating thickness required by the manufacturer.
2. Cooperate with manufacturer, inspection and test agencies engaged or required to perform services in connection with installing the roof system.
3. Insurance/Code Compliance: Where required by code, install and test the roofing system to comply with governing regulation and specified insurance requirements.
4. Protect work from spillage of roofing materials and prevent materials from entering or clogging drains and conductors. Replace or restore work damaged by installation of the roofing system.
5. All primers must be top coated within 24 hours of application. Re-prime If more time passes after priming.
6. Keep roofing materials dry during application. Phased construction can be allowed as long as no, more than 7 days pass between coats excluding primers.
7. Coordinate counter flashing, cap flashings, expansion joints and similar work with work specified in other Sections under Related Work.
8. Coordinate roof accessories and miscellaneous sheet metal accessory items, including piping vents and other devices with work specified in other Sections under Related Work.

B. Scope of Work:

1. Replace any missing or loose fasteners. Use one size larger with neoprene washer.
2. Wire brush any visible rust off roof surface. Use Rust Go Primer to treat exposed metal and allow 24 hours to cure.
3. Replace any rusted panels that have lost structural integrity with like kind.
4. Pressure wash entire roof surface using 10% mix of Simple Green with water to remove any loose dirt.
6. Sand blast previous asphalt / oil based repairs to bare metal as needed.
7. Seam Sealer BG must be applied at a rate of .67gal/sq.
8. Seam Sealer TG must be applied at a rate of 1gal/14ln.ft at 8" wide pass at 1/4" thick. If
9. seams or joints are larger then 1/8" wide, Grip Polyester Soft must be applied
10. or Uni-Bond. All Ridge vents an roof penetrations must be resealed.
11. All vertical seams must be covered with Seam Sealer TG and Grip Polyester Soft or
12. Uni-Bond.

SECTION 075630 – FLUID APPLIED ROOFING RESTORATION (ALTERNATE) (continued):

13. Coat all fasteners with Seam Sealer BG using a brush or roller.
14. Allow Seam Sealer to dry 24-48hrs before applying base coat.
15. Install CPR Base coat at a rate of 1.5gal/sq.
16. Allow CPR Base coat to dry for 24hrs.
17. Apply CPR White Coating at a rate of 1.5gal/sq.
18. Contractor to restore any material spills, drips, or over sprays to original condition.
Contractor responsible for restoring any damages to building as a result of their work.

3.03 CLEANING

- A. Clean-up and remove daily from the site all wrappings, empty containers, paper, loose particles and other debris resulting from these operations.
- B. Remove asphalt markings from finished surfaces.
- C. Repair or replace defaced or disfigured finishes caused by Work of this section.

3.04 PROTECTION

- A. Provide traffic ways, erect barriers, fences, guards, rails, enclosures, chutes and the like to protect personnel, roofs and structures, vehicles and utilities.
- B. Protect exposed surfaces of finished walls with tarps to prevent damage.
- C. Plywood for traffic ways required for material movement over existing roofs shall be not less than 5/8 inch (16 mm) thick.
- D. In addition to the plywood listed above, an underlayment of minimum 1/2 inch (13 mm) recover board is required on new roofing.
- E. Special permission shall be obtained from the Manufacturer before any traffic shall be permitted over new roofing.
- F. Restore any damages to building to original condition prior to final inspection.

3.05 FIELD QUALITY CONTROL

- A. Require attendance of roofing materials manufacturers' representatives at site during installation of the roofing system.
- B. Perform field inspection as required under provisions of Section 014000.
- C. Correct defects or irregularities discovered during field inspection.

3.06 FINAL INSPECTION

- A. At completion of roofing installation and associated work, meet with Contractor, Architect, installer, installer of associated work, roofing system manufacturer's representative and others directly concerned with performance of roofing system.
- B. Walk roof surface areas, inspect perimeter building edges as well as flashing of roof penetrations, walls, curbs and other equipment. Identify all items requiring correction or completion and furnish copy of list to each party in attendance.

SECTION 075630 – FLUID APPLIED ROOFING RESTORATION (ALTERNATE) (continued):

- C. If core cuts verify the presence of damp or wet materials, the installer shall be required to replace the damaged areas at his own expense.
- D. Repair or replace deteriorated or defective work found at time above inspection as required to produce an installation that is free of damage and deterioration at time of Substantial Completion and according to warranty requirements.
- E. Architect upon completion of corrections.
- F. Following the final inspection, provide written notice of acceptance of the installation from the roofing system manufacturer.

END OF SECTION 075630

SECTION 076200 - FLASHING & SHEET METAL

PART 1 - GENERAL:

- 1.01 Conform to profiles and sizes shown on drawings, and comply with "Architectural Sheet Metal Manual" by SMACNA, for each general category of work required.
- A. Metal flashing and counter flashing.
- 1.02 Guarantee: Five-year maintenance guarantee stating that all work in this section not guaranteed under the roof warranty, will remain watertight for a period of 5-years from the date of project acceptance, co-signed by the General Contractor.

PART 2 - PRODUCTS:

- 2.01 Solder: For use with steel or copper, provide 50-50 tin/lead solder (ASTM B 32), with rosin flux.
- 2.02 Fasteners: Same metal as flashing/sheet metal or other non-corrosive metal as recommended by sheet manufacturer. Match finish of exposed heads with material being fastened.
- 2.03 Bituminous Coating: SSPC-Paint 12, solvent-type bituminous mastic, nominally free of sulfur, compounded for 15-mil dry film thickness per coat.
- 2.04 Elastomeric Sealant: Generic type recommended by manufacturer of metal and fabricator of components being sealed and complying with requirements for joint sealants as specified in Section 07900 - Joint Sealers.
- 2.05 Epoxy Seam Sealer: 2-part noncorrosive metal seam cementing compound, recommended by metal manufacturer for exterior/interior nonmoving joints including riveted joints.
- 2.06 Reglets: Metal or plastic units of type and profile indicated, compatible with flashing indicated, noncorrosive.
- 2.07 Metal Accessories: Provide sheet metal clips, straps, anchoring devices, and similar accessory units as required for installation of work, matching or compatible with material being installed, noncorrosive, size and gage required for performance.
- 2.08 Mill Finish Aluminum: ASTM B 209, 3003-H14, with a minimum thickness of 0.040 inch, unless otherwise indicated.
- 2.09 Fabricated Units
- A. Fabricate sheet metal with flat-lock seams; solder with type solder and flux recommended by manufacturer, except seal aluminum seams with epoxy metal seam cement and, where required for strength, rivet seams and joints.
- B. Provide for thermal expansion of running sheet metal work by overlaps of expansion joints in fabricated work. Where required for water-tight construction, provide hooked flanges filled with polyisobutylene mastic for 1-inch embedment of flanges. Space joints at intervals of not more than 50 feet for steel, 24 feet for copper or stainless steel, or 30 feet for zinc alloy or aluminum. Conceal expansion provisions where possible.

SECTION 076200 - FLASHING AND SHEET METAL (continued):

PART 3 - EXECUTION:

- 3.01 Metal Protection: Where dissimilar metals will contact each other or corrosive substrates, protect against galvanic action by painting contact surfaces with bituminous coating or by other permanent separation as recommended by fabricator or manufacturers of dissimilar metals.
- A. Coat side of uncoated aluminum and stainless-steel sheet metal flashing and trim with bituminous coating where flashing and trim will contact wood, ferrous metal, or cementitious construction.
 - B. Underlayment: Where installing metal flashing directly on cementitious or wood substrates, install a course of felt underlayment and cover with a slip sheet or install a course of polyethylene underlayment.
 - C. Bed flanges in thick coat of asphalt roofing cement where required for waterproof performance.
- 3.02 Anchor work in place with noncorrosive fasteners, adhesives, setting compounds, tapes and other materials and devices as recommended by manufacturer of each material or system. Provide for thermal expansion and building movements. Comply with recommendations of "Architectural Sheet Metal Manual" by SMACNA.
- 3.03 Seal moving joints in metal work with elastomeric joint sealants, complying with requirements specified in Division 7 Section "Joint Sealants."
- 3.04 Clean metal surfaces of soldering flux and other substances which could cause corrosion.
- 3.05 Nail flanges of expansion joint units to substrates at spacing of 6 inches o.c.
- 3.06 Composition Stripping: Cover flanges (edges) of work set on bituminous substrate with 2 courses of glass fiber fabric (ASTM D-1668) set in and covered with asphaltic roofing cement.
- 3.07 Performance: Water-tight and weatherproof performance of flashing and sheet metal work is required.

END OF SECTION 076200

SECTION 077140 – METAL GUTTERS AND DOWNSPOUTS

PART – GENERAL

1.01 SECTION INCLUDES

- A. Gutters and downspouts
- B. Accessories

1.02 REFERENCES

- A. American Society for Testing and Materials (ASTM):
 - 1. ASTM A653: Standard Specification for Steel Sheet, Zinc Coated (Galvanized) or Zinc Iron Alloy Coated (Galvannealed) by the Hot Dip Process.
 - 2. ASTM A792: Standard Specification for Steel Sheet, 55 percent Aluminum Zinc Alloy Coated by the Hot Dip Process.
 - 3. ASTM A924: Standard Specification for General Requirements for Steel Sheet, Metallic Coated by the Hot Dip Process.

1.03 SUBMITTALS

- A. Refer to Section 013300 Submittals.
- B. Product Data: Submit manufacturer current technical literature for each type of product.
- C. Samples: Provide nominal 3 x 5 inch sample of each color indicated for gutters, downspouts and accessories.

1.04 QUALITY ASSURANCE

- A. Manufacturer Qualifications: Manufacturer shall have a minimum of five (10) years experience in the production of sheet metal gutters and downspouts.
- B. Fabricator Qualifications: Shall be approved by manufacturer for fabrication of gutters and downspouts.

1.05 DELIVERY, STORAGE AND HANDLING

- A. Refer to Section 015500 – Materials and Equipment.
- B. Store materials on dry, level, firm, and clean surface.

1.06 WARRANTY

- A. Finish Warranty:
 - 1. Manufacturing Defects: Standard form in which manufacturer agrees to repair or replace items that fail by blistering, checks, crazes, flakes, peels or weathers unevenly due to a defect in manufacturing within warranty period from date of original installation.
 - 2. Warranty Period: 20 years.

SECTION 077140 – METAL GUTTERS AND DOWNSPOUTS (continued):

PART 2 – PRODUCTS

2.01 MANUFACTURER

- A. Acceptable Manufacturer: Garland Company, Inc., which is located at: 3800 E. 91st St.; Cleveland, OH 44105; Toll Free Tel: 800-321-9336; Tel: 216-641-7500; Fax: 216-641-0633; Email: mhumbaugh@garlandind.com; Web: www.garlandco.com OR APPROVED EQUAL.

2.02 GUTTERS

- A. Materials: R-Mer Lite 22 ga., Zinc-Coated (Galvanized) Steel Sheet, as per ASTM A653: G90 (Z275) coating designation; structural quality, grade 40 ksi (275 MPa).
- B. Finish on surfaces:
1. Exposed surfaces for coated panels:
 - a. Two coat coil applied Kynar, baked-on full-strength (70% resin) fluorocarbon coating system (polyvinylidene fluoride, PVF2), applied by manufacturer's approved applicator.
 - b. Coating system shall provide nominal 1.0 mil dry film thickness, consisting of primer and color coat.
- C. Box Gutter Fabrication:
1. Gutter Size: 6" wide x 8" deep.
 2. Length: 10' minimum sections.
 3. Expansion joint every 50'-0" minimum for thermal expansion and contraction.

2.03 DOWNSPOUTS

- A. Rectangular downspout fabrication:
1. Size: 4" x 6"
 2. Length: Field Verify
 3. Texture: Corrugated.
 4. Material thickness:

2.04 ACCESSORIES

- A. Gutters:
1. End Caps: Match material, shape and finish of gutter.
 2. Outlet Tubes: Match material and shape of downspout.
 3. Gutter Support:
 - a. Hidden Gutter Hanger: Manufacturer's standard galvanized hidden hanger.
 4. Manufacturer's standard gutter leaf guard.
- B. Downspouts:
1. Downspout Support:
 - a. Exposed strap.
 - b. Color: Match existing downspout.
 2. Miscellaneous downspout components: Provide all necessary elbows, downspout offset sections, and pop rivets as required for a complete installation. All miscellaneous

SECTION 077140 – METAL GUTTERS AND DOWNSPOUTS (continued):

components shall match downspouts.

- C. Fasteners:
 - 1. Galvanized steel fasteners of sufficient length to penetrate minimum 1 inch into substrate.
 - 2. Sealants: Garland Greenlock XL or equal.
- D. Downspout Strainer: Steel wire-ball downspout strainer.
- E. Splash Pans: Fabricate from the following. Size and shape to be 12" wide x 24" long.
 - 1. Pre-cast Concrete: Profile as selected by Architect. Concrete shall be 3,000 psi at 28 days with minimum of 5 percent air entrainment.
- F. Downspout Boot: Replace and connect to existing locations.

2.05 FINISH

- A. Exterior Coating:
 - 1. Standard Coating: Kynar 500 or to exposed side.
 - 2. Color: Match existing.
- B. Interior coating: Manufacturer's standard primer wash coat.

PART 3 – EXECUTION

3.01 PREPARATION

- A. Verify that substrates are in place and ready for installation of gutters and downspouts.

3.02 INSTALLATION

- A. General: Install Work securely in place and provide for expansion and contraction of components using lapped and sealed joints
 - 1. Do not install damaged components.
 - 2. Separate dissimilar metals to prevent galvanic action through the use of bituminous coating or other permanent separation recommended by SMACNA.
 - 3. Space expansion joints in gutters as recommended by manufacturer.
 - 4. Rivet joints where required for strength, exposed rivet shall match gutter or downspout color.
 - 5. Torch cutting of components is not allowed.
- B. Install roof edge flashings at roof edge conditions as indicated on Drawings.
- C. Gutters:
 - 1. Install ¼" gutter supports 36" on center.
 - 2. Slope gutters evenly to downspouts; provide end caps at gutter ends and seal watertight per manufacturer's instructions.
 - 3. Install outlet tubes at all downspout locations, seal watertight.
 - 4. Apply joint sealants at gutter joints per manufacturer's installation instructions.

SECTION 077140 – METAL GUTTERS AND DOWNSPOUTS (continued):

D. Downspouts:

1. Install downspouts, provide elbows and offsets, and secure downspouts to wall construction using downspout supports spaced no more than 45 feet on center. Maximum distance of downspout support from top or bottom of downspout shall be 2 feet. Provide 45 degree elbow at bottom of downspout to direct water away from wall surface or foundation.
2. Where downspout connects to building perimeter drainage system, lap downspout and perimeter drainage pipe a minimum of 3 inches.
3. Install pre-cast concrete splash pans under downspouts.

3.03 CLEANING AND PROTECTION

- A. Remove damaged, defective or improperly installed materials. Replace with new materials installed per requirements of this section.
- B. Clean finished surfaces according to manufacturer's written instructions; maintain clean condition until Final Completion.

END OF SECTION 077140

SECTION 078400 - FIRESTOPPING

PART 1 - GENERAL

1.01 SCOPE OF WORK

- A. Firestopping of Through Penetrations in Rated Assemblies.
- B. Fire Resistive Joint Systems.
- C. Perimeter Fire Containment Systems.
- D. Smoke Seals.
- E. Construction enclosing compartmentalized areas.

1.02 RELATED SECTIONS

- A. Section 01 25 13 – Product Substitution Procedures.
- B. Section 01 33 00 – Submittal Procedures.
- C. Section 01 42 00 – References.
- D. Section 01 45 00 – Quality Control.
- E. Section 01 66 00 – Project Storage and Handling Requirements.
- F. Section 01 78 00 – Closeout Submittals Section 10 42 00 – References.
- G. Section 03 30 00 - Cast-In-Place Concrete: Sleeves and blockouts in concrete assemblies.
- H. Section 04 80 00 - Masonry Assemblies: Sleeves and blockouts in masonry assemblies.
- C. Section 05 50 00 - Metal Decking.
- D. Section 05 81 10 - Architectural Joint Systems.
- E. Section 07 21 00 - Building Insulation.
- F. Section 07 71 60 - Roof Expansion Assemblies.
- G. Section 07 81 00 - Applied Fireproofing.
- H. Section 07 84 10 - Duct Firestopping: Fire resistive duct enclosures.
- I. Section 07 90 00 - Joint Sealers.
- J. Section 08 90 00 - Curtain Wall.
- K. Section 09 25 00 - Gypsum Board.
- L. Division 23 – Heating, Ventilating and Air Conditioning (HVAC): Work requiring firestopping.
- M. Division 26 - Electrical: Electrical work requiring firestopping.

1.03 REFERENCES

- A. See Section 014200 – References for standards, rules, regulations and statutes applicable to this section.

1.04 PERFORMANCE REQUIREMENTS

- A. Provide products that upon curing, do not re-emulsify, dissolve, leach, breakdown or otherwise deteriorate over time from exposure to atmospheric moisture, sweating pipes, ponding water or other forms of moisture characteristic during and after construction.
- B. Provide firestop sealants sufficiently flexible to accommodate motion such as pipe vibration, water hammer, thermal expansion and other normal building movement without damage to seal.
- C. Pipe insulation shall not be removed, cut away or otherwise interrupted through wall or floor openings. Provide products appropriately tested for thickness and type of insulation utilized.
- D. Openings within walls and floors designed to accommodate voice, data and video cabling shall be

SECTION 078400 – FIRESTOPPING (continued):

provided with re-enterable products specifically designed for retrofit.

- E. Penetrants passing through fire-resistance rated floor-ceiling assemblies contained within chase wall assemblies shall be protected with products tested by being fully exposed to fire outside of chase wall. Systems within UL Fire Resistance Directory that meet criterion are identified with words "Chase Wall Optional".
- F. Provide fire-resistive joint sealants sufficiently flexible to accommodate movement such as thermal expansion and other normal building movement without damage to seal.
- G. Provide fire-resistive joint sealants designed to accommodate specific range of movement and tested for purpose in accord with cyclic movement test criteria as outlined in Standards, ASTM E-1399, ASTM E-1966 or ANSI/ UL 2079.
- H. Provide through penetration firestop systems and fire-resistive joint systems and conduct air leakage test in accord with Standards, ANSI/UL1479 and ANSI/ UL2079, respectively, with published L-Ratings for ambient and elevated temperatures as evidence of ability of through penetration firestop system or fire-resistive joint system to restrict movement of smoke.

1.05 SUBMITTALS

- A. Submit in accord with Section 013300 – Submittal Procedures.
- B. Product Data: Provide manufacturer's standard catalog data for specified products demonstrating compliance with referenced standards and listing numbers of systems in which each product is to be used.
- C. Shop Drawings: Submit schedule of opening locations and sizes, penetrating items, and required listed design numbers to seal openings to maintain fire resistance rating of adjacent assembly.
- D. Certificates:
 - 1. Product certificates signed by the firestop system manufacturer certifying material compliance with applicable code and specified performance characteristics.
 - 2. Certification of Installer's Qualifications.
- E. Installation Instructions: Submit manufacturer's printed installation instructions.

1.06 QUALITY ASSURANCE

- A. Products/Systems: Provide firestopping systems that comply with following requirements and as specified in Paragraph 1.04 - Performance Criteria.
 - 1. Firestopping tests shall be performed by qualified, testing and inspection agency, UL approved, or another agency performing testing and follow-up inspection services for firestop systems acceptable to authorities having jurisdiction.
 - 2. Firestopping products bear classification marking of qualified testing and inspection agency.
- B. Installer Qualifications: Experienced in performing work, certified, licensed or otherwise qualified by firestopping manufacturer as having required training to install firestop products in accord with specified requirements.
- C. Mock-Up: Install mock-up using acceptable products and manufacturer approved installation methods.
 - 1. Apply one of each unit type of firestopping material, such as penetrations through fire rated partition, to representative application.
 - 2. Locate where directed.
 - 3. Maintenance: Maintain mock-up during construction for workmanship comparison.
 - 4. Remove and legally dispose of mock-up when no longer required.

SECTION 078400 – FIRESTOPPING (continued):

- D. Preinstallation Meetings: Conduct meeting to verify project requirements, substrate conditions, manufacturer's installation instructions, and warranty requirements. Comply with Division 1 requirements.

1.07 DELIVERY, STORAGE, AND HANDLING

- A. Delivery in manufacturer's original, unopened, undamaged containers, identification labels intact identifying product and manufacturer, date of manufacture; lot number; shelf life, if applicable; qualified testing and inspection agency's classification marking; and mixing instructions for multicomponent materials.
- B. Handle and store products in accord with manufacturer's written recommendations published in technical materials. Leave products wrapped or otherwise protected and under clean and dry storage conditions until required for installation.
- C. Store materials protected from exposure to harmful weather conditions and at temperature and humidity conditions recommended by manufacturer.

1.08 PROJECT CONDITIONS

- A. Do not install firestopping products when ambient or substrate temperatures are outside limitations recommended by manufacturer.
- B. Do not install firestopping products when substrates are wet due to rain, frost, condensation, or other causes.
- C. Maintain minimum temperature before, during, and for minimum 3 days after installation of materials
- D. Do not use materials that contain flammable solvents.
- E. Coordinate construction of openings and penetrating items to ensure that through-penetration firestop systems are installed according to specified requirements.
- F. Coordinate sizing of sleeves, openings, core-drilled holes or cut openings to accommodate through-penetration firestop systems.
- G. Schedule installation of firestopping after completion of penetrating item installation but prior to covering or concealing of openings.
- H. Schedule installation of safing materials in linear opening at curtain wall prior to construction that limits access to safing slot.

PART 2 PRODUCTS

2.01 MANUFACTURERS

- A. Acceptable Manufacturer: Specified Technologies Inc., 200 Evans Way; Somerville, NJ 08876; Tel: 800-992-1180; Tel: 908-526-8000; Fax: 908-526-9623; Website: www.stifirestop.com.
- B. Requests for substitutions will be considered in accord Section 01 25 13 – Product Substitution Procedures.
- C. Single Source: Obtain firestop systems for each type of penetration or joint opening and construction condition indicated only from single manufacturer.

SECTION 078400 – FIRESTOPPING (continued):

2.02 MATERIALS

- A. Use only firestopping products that have been tested for specific fire-resistance-rated construction conditions conforming to construction assembly type, penetrating item type or joint opening width and movement capabilities, annular space requirements, and fire-rating involved for each separate instance.
- B. Latex Sealants: STI SpecSeal Series single component latex formulations that upon cure do not re-emulsify during exposure to moisture, the following products are acceptable:
 - 1. Specified Technologies, Inc. (STI) SpecSeal Series SSS Intumescent Sealant.
 - 2. Specified Technologies, Inc. (STI) SpecSeal Series LCI Intumescent Sealant.
 - 3. Specified Technologies, Inc. (STI) SpecSeal Series LC Endothermic Sealant.
 - 4. Specified Technologies, Inc. (STI) SpecSeal Series AS Elastomeric Spray.
 - 5. Specified Technologies, Inc. (STI) SpecSeal Series ES Elastomeric Sealant.
- C. Firestop Devices: STI SpecSeal Series factory-assembled steel collars lined with intumescent material sized to fit specific outside diameter of penetrating item, the following products are acceptable:
 - 1. Specified Technologies, Inc. (STI) SpecSeal Series SSC Firestop Collars.
 - 2. Specified Technologies, Inc. (STI) SpecSeal Series LCC Firestop Collars.
- D. Wall Opening Protective Materials: STI SpecSeal Series intumescent, non-curing pads or inserts for protection of electrical switch and receptacle boxes to reduce horizontal separation to less than 24 inches (610mm), the following products are acceptable:
 - 1. Specified Technologies, Inc. (STI) SpecSeal Series SSP Firestop Putty Pads.
 - 2. Specified Technologies, Inc. (STI) SpecSeal Series EP PowerShield Insert Pads.
- E. Firestop Putty: STI SpecSeal Series intumescent, non-hardening, water resistant putties containing no solvents, inorganic fibers or silicone compounds, the following products are acceptable:
 - 1. Specified Technologies, Inc. (STI) SpecSeal Series SSP Firestop Putty.
- F. Fire Rated Cable Pathways: STI EZ-PATH device modules comprised of steel raceway with intumescent foam pads allowing 0 to 100 percent cable fill, the following products are acceptable:
 - 1. Specified Technologies Inc. (STI) EZ-PATH Fire Rated Pathway.
- G. Wrap Strips: STI SpecSeal Series single component intumescent elastomeric strips faced on both sides with a plastic film, the following products are acceptable:
 - 1. Specified Technologies, Inc. (STI) SpecSeal Series RED Wrap Strip.
 - 2. Specified Technologies, Inc. (STI) SpecSeal Series BLU Wrap Strip.
 - 3. Specified Technologies, Inc. (STI) SpecSeal Series BLU2 Wrap Strip.
- H. Firestop Pillows: STI SpecSeal Series re-enterable, non-curing, mineral fiber core encapsulated with an intumescent coating contained in a flame retardant poly bag, the following products are acceptable:
 - 1. Specified Technologies, Inc. (STI) SpecSeal Series SSB Firestop Pillows.
- I. Mortar: STI SpecSeal Series Portland cement based dry-mix product formulated for mixing with water at Project site to form a non-shrinking, water-resistant, homogenous mortar, the following products are acceptable:
 - 1. Specified Technologies, Inc. (STI) SpecSeal Series SSM Firestop Mortar.
- J. Silicone Sealants: STI SpecSeal Series moisture curing, single component, silicone elastomeric sealant for horizontal surfaces (pourable or nonsag) or vertical surface (nonsag), the following products are acceptable:
 - 1. Specified Technologies, Inc. (STI) Pensil 300 Silicone Sealant.
 - 2. Specified Technologies, Inc. (STI) Pensil 300 SL Self-Leveling Silicone Sealant.

SECTION 078400 – FIRESTOPPING (continued):

- K. Silicone Foam: STI SpecSeal Series multicomponent, silicone-based liquid elastomers, that when mixed, expand and cure in place to produce a flexible, non-shrinking foam, the following products are acceptable:
 - 1. Specified Technologies, Inc. (STI) Pensil 200 Silicone Foam.
- L. Silicone/Urethane Sealants: STI SpecSeal Series moisture curing, single component, silicone/urethane hybrid elastomeric sealant for horizontal surfaces, the following products are acceptable:
 - 1. Specified Technologies, Inc. (STI) SpecSeal Fast Tack Firestop Spray.
- M. Installation Accessories: Provide clips, collars, fasteners, temporary stops or dams, and other devices required to position and retain materials in place.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Before beginning installation, verify that substrate conditions previously installed under other sections are acceptable for installation of firestopping in accord with manufacturer's installation instructions and technical bulletins.
- B. Surfaces shall be free of dirt, grease, oil, scale, laitance, rust, release agents, water repellents, and any other substances that may inhibit optimum adhesion.
- C. Provide masking and temporary covering to protect adjacent surfaces.
- D. Do not proceed until unsatisfactory conditions have been corrected.

3.02 INSTALLATION

- A. General: Install through-penetration firestop systems and fire-resistive joint systems in accordance with the Performance Criteria and in accord with conditions of testing and classification as specified in published design.
- B. Manufacturer's Instructions: Comply with manufacturer's written instructions for installation of firestopping products and the following.
 - 1. Seal openings or voids made by penetrations to ensure air and water resistant seal.
 - 2. Consult with mechanical engineer, project manager, and damper manufacturer prior to installation of through-penetration firestop systems that might hamper the performance of fire dampers as it pertains to duct work.
 - 3. Protect materials from damage on surfaces subjected to traffic.
 - 4. Apply suitable bond-breaker to prevent three-sided adhesion in applications where conditions might occur such as intersection of gypsum wallboard/steel stud wall to floor or roof assembly where joint is backed by steel ceiling runner or track.
 - 5. Where joint application is exposed to elements, fire-resistive joint sealant must be approved by manufacturer for use in exterior applications and shall comply with ASTM C-920, "Specification for Elastomeric Joint Sealants".

3.03 FIELD QUALITY CONTROL

- A. Keep areas of work accessible until inspection by authorities having jurisdiction.
- B. Where deficiencies are found, repair or replace firestopping products to comply with requirements.

3.04 ADJUSTING AND CLEANING

SECTION 078400 – FIRESTOPPING (continued):

- A. Remove equipment, materials and debris, leaving area in undamaged, clean condition.
- B. Clean all surfaces adjacent to sealed openings to be free of excess firestopping materials and soiling as work progresses.

END OF SECTION 078400

SECTION 079200 - JOINT SEALERS

PART 1 - GENERAL

- 1.01 PRECONSTRUCTION FIELD TESTS: Prior to installation of joint sealers, field-test their adhesion to joint substrates per field adhesion test in AAMA Aluminum Curtain Wall Series No. 13.
- 1.02 SUBMITTALS: Submit product data, samples of each type and color of joint sealer required and certified test reports for joint sealers evidencing compliance with requirements.
- 1.03 COMPATIBILITY: Provide joint sealers, joint fillers and other related materials that are compatible with one another and with joint substrates under service and application conditions, as demonstrated by testing and field experience.
- 1.04 COLORS: Provide color of exposed joint sealers to match color of adjacent surface.

PART 2 - PRODUCTS

- 2.01 ELASTOMERIC SEALANT STANDARD: Provide manufacturer's standard chemically curing, elastomeric sealant of base polymer indicated, complying with ASTM C 920 requirements.
- A. One-Part Nonacid-Curing Silicone Sealant: Type S, Grade NS, Class 25. Uses NT, M, G, A, and O. Additional capability, when tested per ASTM C 719, to withstand 35 percent movement in both extension and compression for a total of 70 percent movement as measured at time of application and still comply with other requirements of ASTM C 920.
- B. One-Part Nonsag Urethane Sealant for Use NT: Type S; Grade NS; Class 25; and Uses NT, M, A, and O.
- 2.02 ACRYLIC SEALANT: Manufacturer's standard one-part nonsag, solvent-release-curing, acrylic terpolymer sealant complying with ASTM C 920 for Type S; Grade NS; Uses NT, M, G, A and O; except for selected test properties which are revised as follows:
- Heat-aged hardness: 40-50
Weight loss: 15 percent
Max. cyclic movement capability: plus or minus 7.5 percent
- 2.03 SILICONE-EMULSION SEALANT: Manufacturer's standard one part, nonsag, mildew-resistant, paintable, silicone-emulsion sealant complying with ASTM C 834.
- 2.04 ACOUSTICAL SEALANT FOR CONCEALED JOINTS: Manufacturer's standard, nondrying, nonhardening, nonskinning, nonstaining, gunnable, synthetic rubber sealant recommended for sealing interior concealed joints to reduce transmission of airborne sound.
- 2.05 FIRESTOP CAULKING AND PUTTY: Provide Firestop Putty or Adhesive Firestop Caulking/Sealant for fire sealing rated partitions at penetrations, junctions with roofing panels, and intersections at dissimilar materials. Firestop putty shall be Nelson FSP Firestop Putty as manufactured by Hevi-Duty/Nelson, OR Approved Equal. Adhesive Firestop caulking/sealant shall be Nelson CLK Adhesive Firestop Sealant as manufactured by Hevi-Duty/Nelson, OR Approved Equal. Materials furnished for firestopping shall comply with ASTM E-84 and ASTM E-814. Comply with manufacturer's instructions for installation and suitability for application.
- 2.06 FOAMED-IN-PLACE FIRE-STOPPING SEALANT: Two-part, foamed-in-place, silicone sealant for use as part of a through-penetration fire-stop system for filling openings around cables, conduit, pipes and similar penetrations through walls and floors, with fire-resistance rating indicated, per ASTM E 814; listed

SECTION 079200 - JOINT SEALERS (continued):

by UL or other testing and inspecting agency acceptable to authorities having jurisdiction.

- 2.07 ONE-PART FIRE-STOPPING SEALANT: One part elastomeric sealant formulated for use as part of a through-penetration fire-stop system for sealing openings around cables, conduit, pipes and similar penetrations through walls and floors, listed by UL or other testing and inspecting agency acceptable to authorities having jurisdiction.
- 2.08 SEALANT BACKINGS, GENERAL: Nonstaining; compatible with joint substrates, sealants, primers and other joint fillers; approved for applications indicated by sealant manufacturer based on field experience and laboratory testing.
- A. Elastomeric Tubing Joint-Fillers: Neoprene, butyl, EPDM, or silicone tubing complying with ASTM D 1056, nonabsorbent to water and gas, capable of remaining resilient at temperatures down to -26 deg F (-15 deg C). Provide products with low compression set and of size and shape to provide a secondary seal, to control sealant depth and otherwise contribute to optimum sealant performance.
- B. Bond-Breaker Tape: Polyethylene tape or other plastic tape as recommended by sealant manufacturer for preventing bond between sealant and joint filler or other materials at back of joint.
- 2.09 PRIMER: As recommended by joint sealer manufacturer where required for adhesion of sealant to joint substrates indicated.
- 2.10 ACCESSORY MATERIALS FOR FIRE-STOPPING SEALANTS: Forming, joint-fillers, packing and other accessory materials as required for installation of fire-stopping sealants.

PART 3 - EXECUTION

- 3.01 GENERAL: Comply with joint sealer manufacturers' instructions applicable to products and applications indicated.
- 3.02 INSTALLATION:
- A. Elastomeric Sealant Installation Std: Comply with ASTM C 962.
- B. Latex Sealant Installation Standard: Comply with ASTM C 790.
- C. Acoustical Sealant Application Standard: Comply with ASTM C 919 for use of joint sealants in acoustical applications.
- D. Installation of Fire-Stopping Sealant: Install sealant, including forming, packing and other accessory materials to fill openings around mechanical and electrical services penetrating floors and walls to provide fire-stops with fire resistance ratings indicated.

END OF SECTION 079200

SECTION 081113 – HOLLOW METAL DOORS AND FRAMES

PART 1 - GENERAL

- 1.01 STANDARDS: In addition to other specified requirements, comply with Steel Door Institute "Recommended Specifications for Standard Steel Doors and Frames" (SDI-100), for the following classifications:
- A. Interior Doors: SDI-100, Grade III, heavy-duty, Model 1, minimum 18-gage faces.
 - B. Exterior Doors: SDI-100, Grade III, extra heavy-duty, Model 2, minimum 16-gage faces.
- 1.02 SUBMITTALS: With manufacturer's standard details and specifications for steel doors and frames, submit shop drawings showing application to project, as required.
- 1.03 FIRE-RATED ASSEMBLIES: Provide units that display appropriate UL or FM labels for fire-rating indicated.
- 1.04 THERMAL INSULATED ASSEMBLIES: Provide thermal insulating door and frame assemblies tested in accordance with ASTM C 236, with U factor of 0.24 Btu/(hr x sq ft x deg. F) or better at all exterior locations.

PART 2 - PRODUCTS

- 2.01 MANUFACTURER: One of the following OR Approved Equal:
- Amweld Building Products, Inc.
 - Ceco Door Products.
 - Curries Co.
 - Mesker Door, Inc.
 - Pioneer Industries, Inc.
 - Steelcraft / Division of Ingersoll Rand.
 - Republic Builders Products.
- 2.02 MATERIALS: Steel doors and frames; hot-rolled, pickled and oiled per ASTM A 569 and A 568; cold-rolled per ASTM A 366 and A 568.
- A. Galvanized sheets: ASTM A 526 with ASTM A 525, A 60 zinc coating, mill phosphatized. (At exterior doors and frames).
 - B. Anchors and Accessories: Manufacturer's standard units. Use galvanized items for units built into exterior walls, complying with ASTM A 153.
 - C. Doors: Comply with SDI-100, of the types and styles indicated, for materials quality, metal gages, and construction details.
 - 1 Provide top cap at all exterior doors.
 - D. Door Frames: All frames shall be 16 gage and comply with SDI-100, of the types and styles indicated, for materials quality, metal gages, and construction details.
 - 1. Provide standard hollow metal frames for doors, transoms, sidelights, borrowed lights, and other openings as indicated.
 - 2. Prepare frames to receive 3 silencers on strike jambs of single-swing frames and 2 silencers on heads of double-swing frames.

SECTION 081113 – HOLLOW METAL DOORS AND FRAMES (continued):

3. Provide 26-gage steel plaster guards or mortar boxes, welded to frame, at back of hardware cutouts where installed in concrete, masonry or plaster openings.
 4. All fire rated frames shall be labeled with a permanently affixed raised metal tag located on the hinge side of frame. Stenciled or paper labels shall not be used.
- 2.03 **FABRICATION:** Fabricate units to be rigid, neat in appearance, and free from defects, warp or buckle. Weld exposed joints continuously, grind, dress, and make smooth, flush and invisible.
- A. **Prepare steel doors and frames** to receive mortised and concealed finish hardware, including cutouts, reinforcing, drilling and tapping, complying with ANSI A 115 "Specifications for Door and Frame Preparation for Hardware".
 - B. Reinforce units to receive surface-applied finish hardware to be field applied.
 - C. Locate finish hardware as indicated or, if not indicated, per DHI "Recommended Locations for Builder's Hardware".
- 2.04 **Shop paint** exposed surfaces of doors and frame units, including galvanized surfaces, using manufacturer's standard baked-on rust inhibitive primer.

PART 3 - EXECUTION

- 3.01 **INSTALLATION:** Install hollow-metal units in accordance with manufacturer's instructions and final shop drawings (if any). Fit doors to frames and floors with clearances specified in SDI-100.
- A. **Install fire-rated units** in accordance with NFPA Std. No. 80.
 - B. **Finish hardware** is specified in another Division-8 section.

END OF SECTION 081113

SECTION 081140 – SINGLE SLIDING ALUMINUM AUTOMATIC CLEAN ROOM DOORS

PART – GENERAL

1.01 RELATED DOCUMENTS

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

1.02 SUMMARY

- A. This section includes the following types of automatic entrance doors:
 - 1. Interior, single automatic entrance doors for Clean Room applications. Refer to clad finish, 2.07 Aluminum Finishes.
- B. Related Sections:
 - 1. Division 7 Sections for caulking to the extent not specified in this section.
 - 2. Division 8 Section “Door Hardware” for hardware to the extent not specified in this Section.
 - 3. Division 8 Section “Glazing” for materials and installation requirements of glazing for automatic entrance doors.
 - 4. Division 26 and 28 Sections for electrical connections including conduit and wiring for automatic entrance door operators and access control devices.

1.03 REFERENCES

- A. References: Refer to the version year adopted by the Authority Having Jurisdiction.
 - 1. ANSI A117.1 - Accessible and Usable Buildings and Facilities.
 - 2. FBC - Florida Building Code.
 - 3. NFPA 70 - National Electrical Code.
 - 4. NFPA 101 - Life Safety Code.
 - 5. FBC – Chapter 10, Section 1008.1.4.3.
- B. American National Standards Institute (ANSI) / Builders Hardware Manufacturers Association (BHMA).
 - 1. ANSI/BHMA A156.10 American National Standard for Power Operated Pedestrian Doors.
 - 2. ANSI Z97.1 Standards for Safety Glazing Material Used in Buildings.
- C. Underwriters Laboratories (UL).
 - 1. UL 325 Standard for Safety for Door, Drapery, Gate, Louver and window Operators and Systems.
- D. American Association of Automatic Door Manufacturers (AAADM).
- E. American Society for Testing and Materials (ASTM).
 - 1. ASTM B221 Standard Specification for Aluminum and Aluminum Alloy Extruded Bars, Rods, Wire, Profiles and Tubes.
 - 2. ASTM B209 Standard Specification for Aluminum and Aluminum Alloy Sheet and Plate.
- F. American Architectural Manufacturers Association (AAMA).

SECTION 081140 – SINGLE SLIDING ALUMINUM AUTOMATIC CLEAN ROOM DOORS
(continued):

- 1. AAMA 611 Voluntary Specification for Anodized Architectural Aluminum.
- G. National Association of Architectural Metal Manufacturers (NAAMM).
 - 1. Metal Finishes Manual for Architectural Metal Products.
- H. Florida Building Code (FBC).
 - 1. **Product must comply with FBC, Chapter 10, Section 1008.1.4.3.**

1.04 DEFINITIONS

- A. Activation Device: Device that, when actuated, sends an electrical signal to the door operator to activate the operation of the door.
 - 1. Knowing act: Consciously initiating the opening of a power operated door using acceptable methods including wall mounted switches such as push plates and controlled access devices such as keypads, card readers and key switches.
- B. Safety Device: A device that detects the presence of an object or person within a zone where contact could occur and provides a signal to stop the movement of the door.
- C. AAADM: American Association of Automatic Door Manufacturers.

1.05 PERFORMANCE REQUIREMENTS

- A. General: Provide doors that have been designed and fabricated to comply with specified performance requirements, as demonstrated by testing manufacturer's corresponding standard systems.
- B. Compliance:
 - 1. ANSI/BHMA A156.10 American National Standard for Power Operated Pedestrian Doors.
 - 2. UL 325 listed.
- C. Automatic door equipment that has been tested and approved for use in an ISO 3 (Class 1) clean room environment.
- D. Automatic door equipment accommodates medium to heavy pedestrian traffic.
- E. Automatic Door equipment accommodates up to the following weights for active leaf doors:
 - 1. Single doors: 300 lbs (136 kg) per active breakout leaf.
- F. Operating Temperature Range: -31° F to 122° F (-35° C to 50° C).
- G. Entrapment Force Requirements:
 - 1. Power Operated Sliding Doors: Not more than 30 lbf (133 N) required to prevent stopped door from closing.
 - 2. Sliding doors provided with a breakaway device shall require no more than 50 lbf (222N) applied 1 inch (25 mm) from the leading edge of the lock stile for the breakout panel to open.

SECTION 081140 – SINGLE SLIDING ALUMINUM AUTOMATIC CLEAN ROOM DOORS
(continued):

1.06 SUBMITTALS

- A. Comply with Division 01 - Submittal Procedures.
- B. Product Data: Manufacturer's product data sheets including installation details, material descriptions, dimensions of individual components and profiles, fabrication, operational descriptions and finishes.
- C. Shop Drawings: Submit manufacturer's shop drawings, including elevations, sections and details, indicating dimensions, materials, and fabrication of doors, frames, sidelites, operator, motion /presence sensor control device, anchors, hardware, finish, options and accessories.
- D. Samples: Submit manufacturer's samples of aluminum finish.
- E. Manufacturers Field Reports: Submit manufacturer's field reports from AAADM certified technician of inspection and approval of doors for compliance with ANSI/BHMA A156.10 after completion of installation.
- F. Operating and Maintenance Manuals: Provide manufacturers operating and maintenance manuals for each item comprising the complete door opening installation in quantity as required in Division 01, Closeout Submittals. The manual to include the name, address, and contact information of the manufacturers providing the hardware and their nearest service representatives. The final copies delivered after completion of the installation test to include spare parts list.
- G. Warranties and Maintenance: Special warranties and maintenance agreements specified in this Section.

1.07 QUALITY ASSURANCE

- A. Manufacturers Qualifications: Engage qualified manufacturers with a minimum 10 years of documented experience in manufacturing of doors and equipment of similar to that indicated for this Project and that have a proven record of successful in-service performance.
 - 1. A manufacturer with company certificate issued by AAADM.
- B. Installer Qualifications: Installers, trained by the primary product manufacturers, with a minimum 3 years documented experience installing and maintenance of units similar in material, design, and extent to that indicated for this Project and whose work has resulted in construction with a record of successful in-service performance.
- C. Certified Inspector Qualifications: Certified by AAADM.
- D. Source Limitations for Automatic Entrances: Obtain each type of door, frame, operator and sensor components specified in this Section from a single source, same manufacturer unless otherwise indicated.
- E. Power-Operated Pedestrian Door Standard: ANSI/BHMA A156.10 (current version).
- F. Emergency Exit door requirements: Comply with requirements of authorities having jurisdiction for automatic entrance doors serving as a required means of egress. See FBC, Chapter 10, Section 1008.1.4.3.

1.08 PROJECT CONDITIONS

- A. Field Measurements: Verify actual dimensions of openings to receive automatic entrances by field

SECTION 081140 – SINGLE SLIDING ALUMINUM AUTOMATIC CLEAN ROOM DOORS
(continued):

measurements before fabrication and indicate on shop drawings.

1.09 COORDINATION

- A. Coordinate sizes and locations of recesses in concrete floors for recessed tracks and thresholds if applicable. Concrete, reinforcement and formwork are specified in Division 03.
- B. Electrical System Roughing-in: Coordinate layout and installation of automatic entrances with connections to power supplies and access control system as applicable.

1.10 WARRANTY

- A. General Warranty: Reference Division 01, General Requirements. Special warranties specified in this Article shall not deprive Owner of other rights Owner may have under other provisions of the Contract Documents and shall be in addition to, and run concurrent with, other warranties made by Contractor under requirements of the Contract Documents.
- B. Automatic Entrance Doors shall be free of defects in material and workmanship for a period of One (1) year from the date of substantial completion.
- C. During the warranty period a factory-trained technician shall perform service and affect repairs. A safety inspection shall be performed after each adjustment or repair and a completed inspection form shall be submitted to the Owner.
- D. During the warranty period all warranty work, including but not limited to emergency service, shall be performed during normal business hours.
- E. Manufacturer shall have in place a dispatch procedure that shall be available 24 hours a Day, 7 Days a week for emergency call back service.

PART 2 – PRODUCTS

2.01 MANUFACTURERS

- A. Manufacturer: ASSA ABLOY Entrance Systems, 1900 Airport Road, Monroe, NC 28110. Toll Free (877) SPEC-123. Phone (704) 290-5520 Fax (704) 290- 5555 Website www.assaabloyentrance.com contact: specdesk.na.aes@assaabloy.com OR approved equal.
- B. Substitutions: Requests for substitution and product approval in compliance with the specifications must be submitted in writing and in accordance with the procedures outlined in Division 1, Section, "Substitution Procedures". Approval of requests is at the discretion of the architect, owner, and their designated consultants.

2.02 SLIDING AUTOMATIC ENTRANCES

- A. Model: Besam SL500 Clean Room sliding automatic doors. (Basis of Design):
 - 1. Stainless Steel doors and frames with view panel and active door leaves.
 - 2. Overhead concealed, electro-mechanical, microprocessor controlled, sliding door operator.
 - 3. Operator housing, guide system, and door carriers with battery back-up.
 - 4. Non-shedding type weather-stripping.

SECTION 081140 – SINGLE SLIDING ALUMINUM AUTOMATIC CLEAN ROOM DOORS
(continued):

B. Sliding Automatic Entrance Doors Configuration:

1. Single slide, full breakout, door system.
 - a. Configuration: Single slide, two equal panel door unit with one operable leaf and one sidelite unit.
 - b. Traffic Pattern: Two-way.
 - c. Emergency Breakaway Capability: Interior sliding leaf and sidelite unit.
 - d. Mounting: Overhead header installed between jambs.
2. Dimensions: Confirm door package dimensions as indicated on Architectural drawings.

2.03 ALUMINUM DOORS AND FRAMES (See Clad Finish – Aluminum)

A. Doors and Frames: Extruded Aluminum, Alloy 6063-T5.

1. Door panels shall have a minimum .125 inch (3.2 mm) structural wall thickness including adjoining horizontal members and perimeter frames where applicable.
2. Door Construction shall be by means of an integrated corner block with 3/8 inch all-thread through bolt from each stile.
3. Glass stops shall be .062 inch (15.8 mm) wall thickness and shall provide security function as a standard by means of a fixed non-removable exterior section with glazing to be performed from the interior only. Glazing stops that allow for glass removal from the exterior shall not be deemed as equivalent.
 - a. 45 degree sloped horizontal glass stops.
4. The sliding door system shall include two interlocks securing the leading stile of the butt stile of the sliding door panel together.
5. Gasketing shall be slide-in type, replaceable pile non-shedding Santoprene seals retained by the aluminum extrusions. The following types of gasketing are required: complementing gasketing on the joining vertical stiles of the sidelite and sliding door panels, complementing gasketing on the lead edge of the lock stiles of bi-parting doors, gasketing between the carrier and the header, gasketing on the lead edge stile of single slide door panels, gasketing on the pivot stile of breakout sidelite panels, and gasketing on the butt stile of fixed sidelite panels.

B. Glass: Glazing shall comply with ANSI Z97.1, thickness as indicated.

1. Glazing Active Door Panels: Inset view panel 1/4" (6 mm) tempered, unless otherwise specified.
2. Glazing Installation: See Division 8 Section Glazing for requirements.

C. Door Carriers: Manufacturer's standard carrier assembly that allows vertical adjustment.

1. Carriage Assembly: Carriage bar with two wheel assemblies. Each assembly shall have tandem roller wheels.
2. Roller Wheels: Two heavy duty Delrin roller wheels per wheel assembly, for a total of four (4) roller wheels, 1-7/16 inch (36.51 mm) diameter, per active door leaf for operation over a replaceable aluminum track. Single journal with sealed oil impregnated bearings.

SECTION 081140 – SINGLE SLIDING ALUMINUM AUTOMATIC CLEAN ROOM DOORS

(continued):

3. Two (2) heavy duty self-aligning anti-risers per leaf.
- D. Framing Members: Provide automatic entrances as complete assemblies. Manufacturer's standard extruded aluminum framing reinforced as required to support loads.
 1. Vertical Jamb shall be 1-3/4 inches (44.5 mm) by 4-1/2 inches (114.3 mm).
- E. Header: Manufacturer's standard one-piece extruded aluminum header with a replaceable aluminum track extending full width of entrance unit. Header to conceal door operators, carrier assemblies, and roller track; complete with hinged access panel for service of door operator, and controls.
 1. Span: Maximum 16'-0" (4.9 m) without intermediate supports when using 1/4-inch glass.
 - a. Capacity: Capable of supporting active breakout leafs up to maximum of 300 lb (136 kg) per leaf when header is supported per manufacturer's recommendations.
 2. Design: Manufacturer's standard closed header.
- F. Hardware: Provide manufacturer's standard hardware as required for operation indicated.
 1. Breakaway arms and bottom pivot assemblies shall be supplied by the manufacturer and shall be adjustable to comply with applicable codes.
 - a. Magnetic catch(s) to retain breakout door and sidelite panels in the closed position.
 2. Locking hardware shall be provided as indicated.
 - a. Electrified slide lock shall automatically lock the sliding function of the entrance when the door panels are in the closed position.
 - 1) Fail safe operation: Slide lock shall unlock the sliding function of the door panels upon loss of power.
- G. Guide Track/Threshold: Manufacturer's threshold as indicated.

2.04 **SLIDING DOOR OPERATOR**

- A. Door Operator and Controller:
 1. Electro-mechanical controlled unit utilizing a high-efficiency, energy efficient, DC motor requiring a maximum of 3 amp current draw, allowing 5 operators on one 20 amp circuit. The supplied system shall have the capability to operate at full performance well beyond a brown out and high line voltage conditions (85V – 265V) sensing changes and adjusting automatically. The operator shall allow an adjustable hold open time delay of 0 to 60 seconds and have internal software to incorporate a self-diagnostic system.
- B. Microprocessor Control Box:
 1. Modular control unit to allow for changing technology. Factory-adjusted configuration with opening and closing speeds set to comply with ANSI/BHMA A156.10 requirements and electronic dampening to reduce wear on drive train. Should the drive train operations deviate from design criteria ranges, Watchdog Control Circuit Monitoring will assume command of the system and shut down the automatic function allowing a secondary supervisory circuit to perform as a backup. Control unit shall allow the following functions:
 - a. Diagnostics with the ability to produce application data.
 2. Mode Selector Control:
 - a. Keyed cylinder mode selector switch to be interior jamb mounted and shall allow

SECTION 081140 – SINGLE SLIDING ALUMINUM AUTOMATIC CLEAN ROOM DOORS

(continued):

selection of the indicated functions to be engaged when switch is turned to the appropriate setting.

- b. Mode selector control to allow the following functions:
 - 1) “Off”
 - 2) “Exit Only” one way traffic with automatic operation from the interior.
 - 3) “Two Way Traffic” allowing automatic operation from exterior and interior.
 - 4) “Partial Opening” energy saving door position allows door to automatically adjust opening width based on amount of usage, that is, full open during high use and partial open during low use. The control for this setting is programmable allowing adjustment to both the usage setting and the opening width.
 - 5) “Hold Open” doors activated and held in the full open position.

2.05 ACTIVATION AND SAFETY CONTROL DEVICES

- A. General: Provide the types of activation and safety devices specified in accordance with ANSI/BHMA standards, for the condition of exposure and for long-term, maintenance-free operation under normal traffic load for type of occupancy indicated. Coordinate activation and safety devices with door operation and door operator mechanisms.
- B. Combination Activation Motion Sensor/Safety Presence Sensor:
 - 1. Shall be a sliding door sensor utilizing K-band microwave technology to detect motion and focused active infrared technology to detect presence, combined in a single housing surface mounted on each side of the header.
 - a. Presence sensor shall remain active at all times.
 - b. The sensor shall communicate with the automatic door operator through a self-monitoring connection that allows the door to go into a fail safe mode preventing the door from closing in the event of a sensor failure.
 - 2. Motion/presence detecting sensors to be field installed and adjusted.

2.06 ELECTRICAL

- A. High-Efficiency DC Motor: Maximum of 3 amp current draw, allowing 5 operators to run on one 20 Amp circuit.
- B. Power: Self-detecting line voltage capable control. 120 VAC through 240 VAC, 50/60 Hz, 3 amp minimum incoming power with solid earth ground connection for each door system.
- C. Key Impulse Input: Input for card readers or remote activation with independent adjustable hold open delay.
- D. Wiring: Separate internal channel raceway free from moving parts.
- E. Brown out / high voltage capability: System has capability to operate at full performance well beyond brown out and high voltage line conditions (85 V – 265 V) sensing changes and adjusting automatically.
- F. Convenience Battery: Shall be concealed in header and capable of full operation with blackout conditions, including sensor capabilities for minimum of 100 cycles.

SECTION 081140 – SINGLE SLIDING ALUMINUM AUTOMATIC CLEAN ROOM DOORS
(continued):

2.07 ALUMINUM FINISHES

- A. Comply with NAAMM's "Metal Finishes Manual for Architectural and Metal Products" for recommendations for applying and designating finishes.
- B. Clad Finish:
 - 1. Aluminum, AAMA 611, Clear, AA-M12C22A41, Class I, 0.018mm.

PART 3 - EXECUTION

3.01 EXAMINATION

- A. Examine doors and frames, with Installer present, for compliance with requirements for installation tolerances, wall and floor construction, and other conditions affecting performance.
- B. Examine roughing-in for electrical source power to verify actual locations of wiring connections.
- C. Proceed only after such discrepancies or conflicts have been resolved.

3.02 INSTALLATION

- A. Do not install damaged components. Fit frame joints to produce hairline joints free of burrs and distortion. Rigidly secure non-movement joints.
- B. Entrances: Install automatic entrances plumb and true in alignment with established lines and grades without warp or rack of framing members and doors. Anchor securely in place.
 - 1. Install surface mounted hardware using concealed fasteners to greatest extent possible.
 - 2. Set headers, carrier assemblies, tracks, operating brackets and guides level and true to location with anchorage for permanent support.
- C. Door Operators: Connect door operators to electrical power distribution system as specified in Division 26 Sections.
- D. Glazing: Glaze sliding automatic entrance door panels in accordance with the Glass Association of North America (GANA) Glazing Manual, published recommendations of glass product manufacturer, and published instructions of automatic entrance system manufacturer.
- E. Sealants: Comply with requirements specified in division 7 Section "Joint Sealants" to provide air tight installation.
 - 1. Set thresholds, bottom guide and track systems and framing members in full bed of sealants.
 - 2. Seal perimeter of framing members with sealant.
- F. Signage: Apply signage on both sides of each door and sidelite as required by ANSI/BHMA A156.10 and manufacturers installation instructions.

SECTION 081140 – SINGLE SLIDING ALUMINUM AUTOMATIC CLEAN ROOM DOORS
(continued):

3.03 FIEDL QUALITY CONTROL

A. Manufacturers Field Services:

1. Manufacturer's representative shall provide technical assistance and guidance for installation of doors.
2. Before placing doors into operation, AAADM certified technician shall inspect and approve doors for compliance with ANSI/BHMA A156.10. Certified technician shall be approved by manufacturer.

3.04 ADJUSTING

- A. Adjust door operators, controls and hardware for smooth and safe operation and for weather tight closure. Adjust doors in compliance with ANSI/BHMA A156.10.

3.05 CLEANING AND PROTECTION

- A. Clean adjacent surfaces soiled by door installation.
- B. Clean glass and metal surfaces promptly after installation. Remove excess sealants, compounds, dirt and other substances. Repair damages finish to match original finish.
1. Comply with requirements in Division 08 Section Glazing for cleaning and maintaining glass.

3.06 DEMONSTRATION

- A. Engage a factory-authorized representative to train Owner's maintenance personnel to adjust, operate, and maintain safe operation of the door.

END OF SECTION 081140

BESAM SL500 CLEAN ROOM
 SURFACE APPLIED ACTIVE LEAF ONLY
 NARROW STILE SINGLE SLIDE DOOR SYSTEM

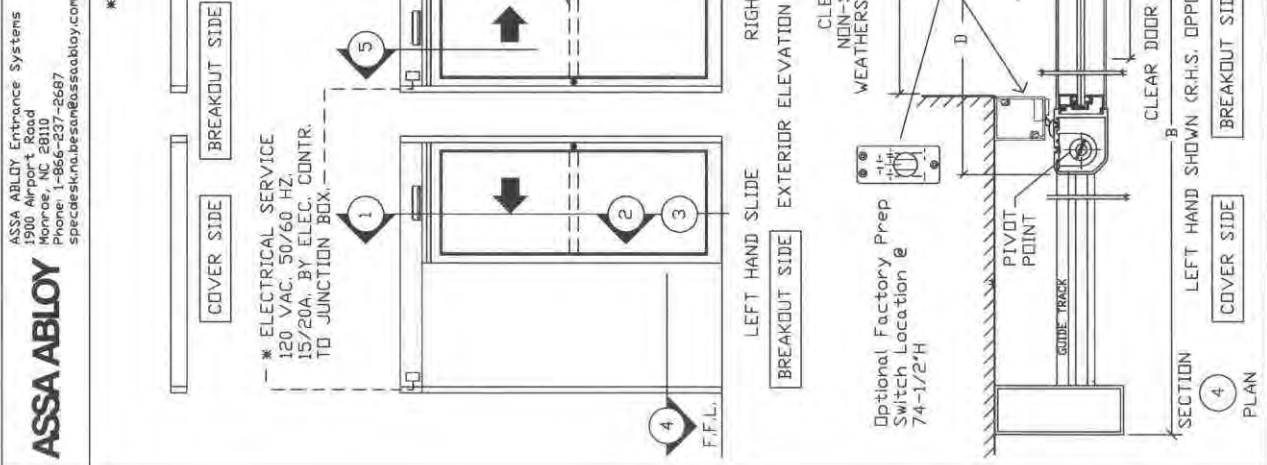
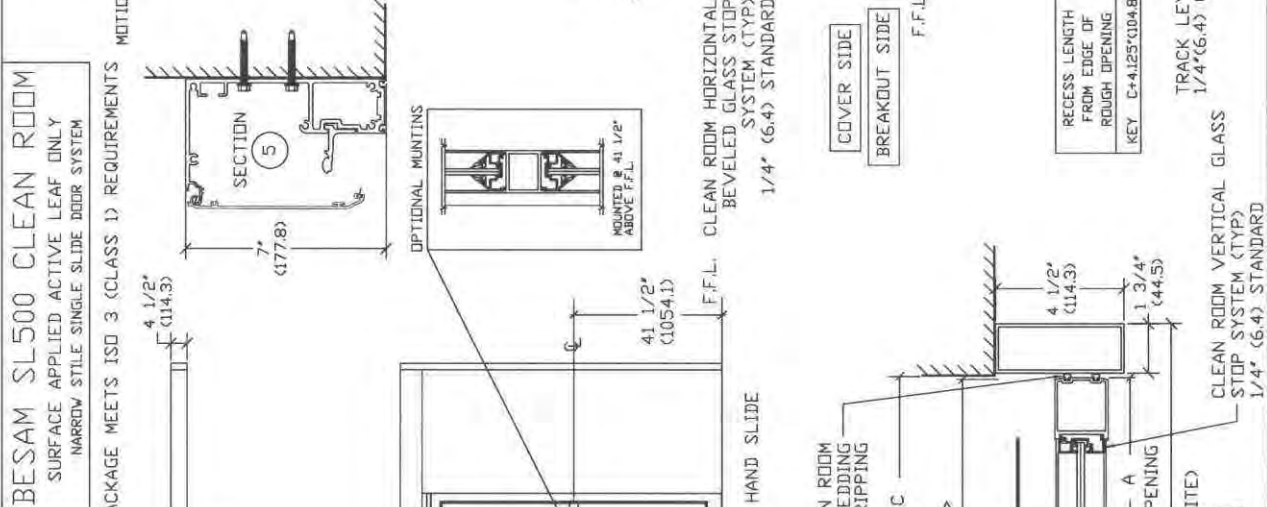
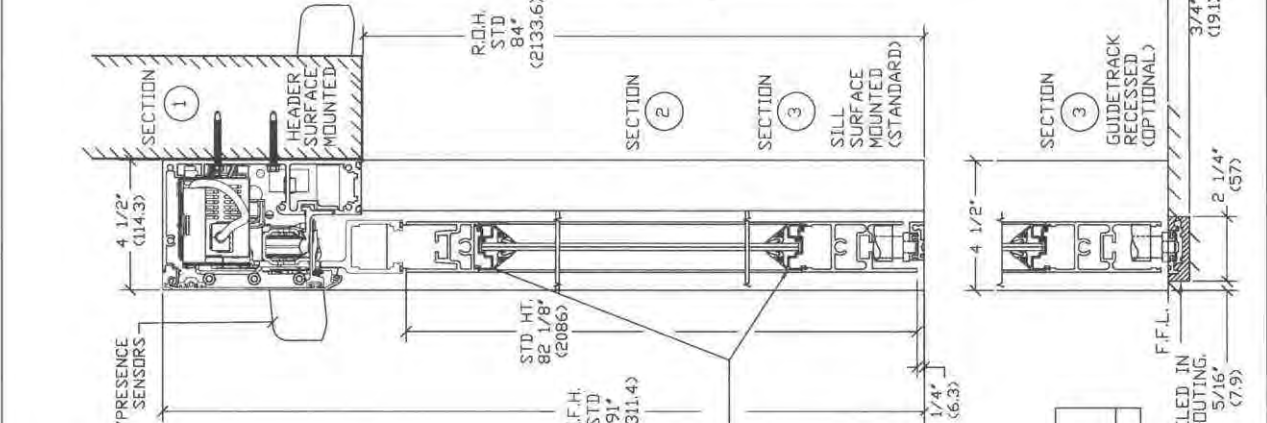
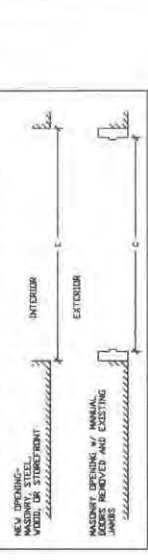
NOTE: THE STANDARD PACKAGE CONSISTS OF:
 THE AUTOMATIC OPERATOR & NON-SHEDDING WEATHERSTRIP, FRAMES,
 & DOORS WITH VERTICAL NON-SHEDDING WEATHERSTRIP, EMERGENCY
 BREAKAWAY, OPTIONAL POSITION SWITCHES (DIGITAL 3 OR 5) OR KEY
 (S), OFF-EXIT ONLY-AUTO-REDUCED OPENING-HOLD OPEN OR OFF,
 AUTO, HOLD OPEN), MOTION/PRESENCE SENSORS,
 OPTIONAL ELBOW ACTIVATION SWITCH, BESAM ELECTRICAL CARRIAGE
 LOCK
 STANDARD FINISH: CLEAR-AA-M1C222441, CLASS 1, 018 MM
 SPECIAL FINISHES ARE AVAILABLE.

NOTE: DRAWING IS DIMENSIONED IN BOTH ENGLISH AND METRIC
 REF. AS FOLLOWS 1" (25.4) ALL METRIC SIZES ARE MILLIMETERS.
 * FOR MAXIMUM CURRENT DRAW PER OPERATOR, SEE PRODUCT
 SPECIFICATION, INSTALLATION INSTRUCTIONS, OR THE UL
 LABEL ON THE EQUIPMENT.
 REFER TO RELEVANT LOCAL, STATE, NATIONAL, OR A.N.S.I. BUILDING
 CODE FOR MIN. DOOR HEIGHT & MIN/MAX WIDTH ALLOWABLE
 FOR EGRESS REQUIREMENT IN CONJUNCTION WITH TABLE BELOW.

MASONRY OPENING WIDTH C	ACTIVE LEAF WIDTH D	DOOR OPENING A	OVERALL HEIGHT B	ROUGH OPENING HEIGHT	OVERALL FRAME WIDTH B
36" (914.4)	38 5/8" (981.1)	32 3/8" (822.3)	91" (2311.4)	84" (2134)	78 1/4" (1997.6)
42" (1066.8)	44 5/8" (1135.2)	38 3/8" (974.7)	91" (2311.4)	84" (2134)	90 1/4" (2292.4)
48" (1219.2)	50 5/8" (1286.5)	44 1/2" (1130.1)	91" (2311.4)	84" (2134)	102 1/4" (2601.6)
54" (1371.6)	56 5/8" (1437.8)	50 1/2" (1282.8)	91" (2311.4)	84" (2134)	114 1/4" (2901.6)
60" (1524)	62 5/8" (1589.1)	56 1/2" (1433.1)	91" (2311.4)	84" (2134)	126 1/4" (3201.6)
KEY	C-2 5/8" (68.3)	C-3 5/8" (91.4)	RHH-77 (2134)	DPH-77 (2134)	2C+6 1/8" (52.1)
	C-2 5/8" (68.3)	C-3 5/8" (91.4)	RHH-77 (2134)	DPH-77 (2134)	2C+6 1/8" (52.1)

DPV NOTE: CONSULT FACTORY FOR EXTENDED HEADERS.
 WIDTH C-2 1/4"
 HEIGHT GPH-15 7/8"
 GPH-1403.2)

* NARROW STILE RAILS #1/4" GUTTER, NO MUTTINS BASED ON MASONRY OPENING



ASSA ABLOY

SECTION 081416 - FLUSH WOOD DOORS

PART 1 - GENERAL

- 1.01 QUALITY STANDARDS: Comply with NWWDA I.S.1 and AWI "Architectural Woodwork Quality Standards".
- 1.02 SUBMITTALS: In addition to product data, submit Samples 1'-0" square, of each type of core construction, face material and finish required.
- 1.03 WARRANTY: Provide manufacturer's life time of installation warranty for interior wood doors.

PART 2 - PRODUCTS

- 2.01 APPROVED MANUFACTURERS: Subject to compliance with requirements, provide wood doors by one of the following:

Algoma Hardwoods, Inc.
Buell Door Company.
Eggers Industries, Architectural Door Division.
Marshfield Door Systems, Inc.
Oshkosh Architectural Door Company.
V. T. Industries.

- 2.02 GENERAL WOOD DOOR PRODUCT REQUIREMENTS: Provide doors with same exposed surface material on both faces of each door, unless otherwise indicated.

- A. Louvers: Manufacturer's standard louvers of type, materials and size indicated:
1. Material: Color anodized aluminum. Color to be selected by Architect.

- 2.03 INTERIOR SOLID CORE DOORS FOR TRANSPARENT FINISH: As follows:

- A. Faces: Natural birch, rotary sliced.
- B. AWI Grade: Premium.
- C. Construction: PC-5 (Particleboard core, 5-ply).
- D. Finish: To be selected by architect.
- E. Metal Frames for Light Openings: Manufacturer's standard 18-gage cold-rolled steel frame, factory-primed, to be painted in field. Color to be selected by Architect.

- 2.04 INTERIOR FIRE-RATED SOLID CORE DOORS: Labeled and listed for rating indicated, by testing and inspection agency acceptable to authorities having jurisdiction, complying with the following requirements:

- A. Faces and AWI Grade: Match faces of non-rated doors in same area of building, unless otherwise indicated.
- B. Edge Construction: Manufacturer's standard laminated edge construction for improved screw-holding capability and split resistance.
- C. Pairs: Furnished formed steel edges and astragals for pairs of fire-rated doors, unless otherwise indicated.
- D. Metal Frames for Light Openings in Fire Doors: Manufacturer's standard 18-gage cold-rolled steel

SECTION 081416 - FLUSH WOOD DOORS (continued):

frame, factory-primed, approved for use in door of fire-rating indicated.

- E. All doors in stairwells shall be temperature rise doors.
 - F. Fire rated doors shall be labeled with a permanently affixed raised metal tag located on the hinge side of the door. Stenciled or paper labels shall not be used.
- 2.05 **FABRICATION:** Fabricate flush wood doors to produce doors complying with following requirements:
- A. In sizes indicated for job-site fitting.
 - B. Metal Astragals: Pre-machine astragals and formed steel edges for hardware where required for pairs of fire-rated doors.
 - C. Openings: Cut and trim openings through doors to comply with applicable requirements of referenced standards for kind(s) of doors required.
 - I. Light Openings: Trim openings with moldings of material and profile indicated.
 - D. Louvers: Factory install louvers in prepared openings.
- 2.06 **SHOP SEAL** faces and edges of doors for field-applied transparent finish with stain (if required) and other required pre-treatments and first coat of finish as specified in Division-9 section "Painting".

PART 3 - EXECUTION

3.01 **INSTALLATION:**

- G. Install wood doors to comply with manufacturer's instructions and of referenced AWI standard and as indicated.
 - B. Install fire-rated doors in corresponding fire-rated frames in accordance with requirements of NFPA No. 80.
- 3.02 **ALIGN AND FIT** doors in frames with uniform clearances and bevels. Machine doors for hardware. Seal cut surfaces after fitting and machining.
- 3.03 **PRE-FIT DOORS:** Fit to frames for uniform clearance at each edge.

END OF SECTION 081416

SECTION 081513 - PLASTIC LAMINATE WOOD DOORS

PART 1 - GENERAL

1.01 SECTION INCLUDES: Wood doors non-rated and fire-rated.

A. Flush

1.02 RELATED SECTIONS

A. Section 081113 – Hollow Metal Frames

B. Section 087100 - Finish hardware

C. Section 134900 – Radiation Protection

1.03 REFERENCES AND REGULATORY REQUIREMENTS

A. ASTM E152 - Methods of Fire Tests and Door Assemblies.

B. NFPA 252 - Standard Methods for Fire Assemblies.

C. UBC 7-2, 1997, IBC 2000

D. NFPA 80 - Fire Doors and Windows.

E. Quality Standards:

1. WDMA Industry Standard I.S. 1-A-97

2. AWI Quality Standards 8th Edition, Version 1.0 2003

3. WIC Manual of Millwork, 9th Edition, 1998

4. ANSI A115. W Series, Wood Door Hardware Standards.

F. Labeling Agencies

1. Intertek Testing Services-Warnock Hersey (ITS-WH) [or]

2. Underwriters Laboratories, Inc. (UL)

1.04 SUBMITTALS

A. Submit under provisions of Section 013300.

B. Shop drawings: Illustrate door opening criteria, elevations, sizes, types, swings, undercuts, special beveling, hardware blocking in mineral core doors, identify cutouts.

C. Product Data: Indicate door core materials, thickness, construction, veneer species.

D. Construction samples: Submit one or more of manufacturer's standard samples demonstrating door construction.

E. Finish samples: A set of 3 illustrating the range of color and grain of the specified door face materials.

F. Manufacturer's full lifetime warranty

1.05 QUALITY ASSURANCE

SECTION 081513 - PLASTIC LAMINATE WOOD DOORS (continued):

- A. Meet or exceed WDMA L.S.1-A Premium Grade, AWI Version 7 Custom Grade and / or WIC Custom Grade.
- B. Labeled Doors: Listed and conform to the requirements of:
 - 1. Intertek Testing Services-Warnock Hersey (ITS-WH)
 - 2. Underwriters Laboratories (UL).

1.06 DELIVERY STORAGE AND HANDLING AND SITE CONDITIONS

- A. Deliver, store, protect and handle products under provisions of WDMA, AWI, WIC and manufacturer's care and handling instructions.
- B. Accept doors on site in manufacturer's standard packaging. Inspect for damage. Do not store in damp or wet areas. HVAC systems should be operating and balanced prior to arrival of doors. Acceptable humidity shall be no less than 25% nor greater than 55%. (NOTE: Any claim for warp, bow, twist or telegraphing may be denied if required humidity requirements are not maintained).
- C. Certain wood species are light sensitive. Protect doors from exposure to natural and artificial light after delivery.

1.07 COORDINATION

- A. Coordinate work under provisions of Section 013100.
- B. Coordinate the work with door opening construction, door frame and door hardware installation with a pre-installation conference.

1.08 WARRANTY

- A. Provide manufacturer's warranty to the following term:
 - 1. Interior Solid Core Doors: "Full Life of Original Installation" including rehang and refinish if door(s) do not comply with warranty tolerance standards.
 - 2. Include coverage for delamination, warping, bow, cup and telegraphing of core construction beyond warranty tolerances.

PART 2. PRODUCTS

2.01 MANUFACTURER

- A. Provide Marshfield DoorSystems, Inc., Marshfield Signature Series™ OR approved equal by one of the following:
 - 1. Algoma Hardwoods, Inc.
 - 2. Eggers Industries

2.02 MATERIALS

- A. Workmanship
 - 1. Comply with WDMA workmanship for veneer faces, vertical edges, crossbands, horizontal edges and dimensional tolerances.
- B. Door Construction Grade
 - 1. Except as otherwise shown on the drawings fabricate the work of this section to WDMA "Premium Grade"

SECTION 081513 - PLASTIC LAMINATE WOOD DOORS (continued):

- C. Wood Door Facing
 - 1. Plastic Laminate: Satin Stainlee, 4830K-18.
- D. Door Edges: 3mm PVC
 - 1. PVC: Dove Grey or Charcoal Grey.

2.03 FABRICATION

- A. Door Panel Core Construction
 - 1. Non-rated complying with ANSI A20:
 - a. 1-LD-2 Particleboard, DPC-1;
 - 2. 1-LD-2, Particleboard; DFP-20PP
 - 3. 45, 60 or 90 minute mineral core fire-rated:
 - a. Fire Rated Mineral Core; DFM-45PP, -60PP, -90PP
 - 4. **All edges to be 3mm PVC.**
- B. Adhesives
 - 1. Face Adhesive: Type 1.
- C. Innerblocking For Mineral Core Fire Doors
 - 1. Supply innerblocking for all surface applied hardware - Through bolts not accepted.

2.04 ACCESSORIES

- A. Louvers
 - 1. Louvers to be furnished by the door manufacturer.
 - 2. Metal Louvers: See Mechanical Drawings.
- B. Glazing Stops
 - 1. Non-Rated:
 - a. W-8 Reveal Lite Molding
 - 2. Fire-Rated:
 - a. Metal Vision Frames.
 - b. W-8 Reveal Lite Molding (20 minute only)
- C. Glass & Glazing in Wood Doors
 - 1. Glass and glazing provided by the wood door manufacturer.

PART 3. EXECUTION

3.01 EXAMINATION

- A. Verify substrate opening conditions.
- B. Verify that opening sizes and tolerances are acceptable and ready to receive this work.
- C. Do not install doors in frame openings that are not plumb or are out of tolerance for size or alignment.

3.02 INSTALLATION

- A. Install fire-rated and non-rated doors in accordance with NFPA 80, manufacturers' instructions

SECTION 081513 - PLASTIC LAMINATE WOOD DOORS (continued):

and to ITS-WH/UL requirements.

- B. Trim non-rated door width by cutting equally on both jamb edges.
- C. Trim door height by cutting bottom edges to a maximum 3/4 inch (19-mm).
- D. Trim fire door height at bottom edge only, in accordance with fire rating requirements.
- E. Pilot drill screw and bolt holes using templates provided by hardware manufacturer. [Use threaded throughbolts for half surface hinges].
- F. EXERCISE CAUTION WHEN DRILLING PILOT HOLES AND INSTALLING HINGES SO THAT PILOT HOLES ARE NOT OVER DRILLED AND SCREWS ARE NOT OVER TORQUED. FOLLOW MANUFACTURERS INSTALLATION INSTRUCTIONS FOR POSITIVE PRESSURE DOORS.
- G. Coordinate installation of doors with installation of frames and hardware.
- H. Manufacturer shall install glass in wood doors.
- I. Install door louvers and light kits plumb and level.
- J. Reseal or refinish any doors that required site alteration.

3.03 WARRANTY TOLERANCES

- A. Conform to WDMA standards and testing methods for warp, cup, bow and telegraphing.

3.04 ADJUSTING

- A. Adjust doors for smooth and balanced door movement.

END OF SECTION 081513

SECTION 083300 – OVERHEAD COILING SERVICE DOORS

PART – GENERAL

1.01 SECTION INCLUDES

- A. Overhead coiling doors.

1.02 RELATED SECTIONS

- A. Section 055000 - Metal Fabrications: Support framing and framed opening.
- B. Section 061000 - Rough Carpentry: Wood jamb and head trim.
- C. Section 087100 – Finish Hardware: Product Requirements for cylinder core and keys.
- D. Section 161300 - Raceway and Boxes: Conduit from electric circuit to door operator and from door operator to control station.
- E. Section 161500 - Wiring Connections: Power to disconnect.

1.03 REFERENCES

- A. NFRC 102 - Test Procedure for Measuring the Steady-State Thermal Transmittance of Fenestration Systems.
- B. ASTM E 90 - Standard Test Method for Laboratory Measurement of Airborne Sound Transmission Loss of Building Partitions and Element.
- C. ASTM E 330 - Standard Test Method for Structural Performance of Exterior Windows, Doors, Skylights and Curtain Walls by Uniform Static Air Pressure Difference.
- D. ASTM A 653 - Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process.
- E. ASTM A 666 - Standard Specification for Austenitic Stainless Steel Sheet, Strip, Plate, and Flat Bar.
- F. ASTM A 924 - Standard Specification for General Requirements for Steel Sheet, Metallic-Coated by the Hot-Dip Process.
- G. ASTM B 221 - Standard Specification for Aluminum and Aluminum-Alloy Extruded Bars, Rods, Wire, Profiles, and Tubes.
- H. NEMA 250 - Enclosures for Electrical Equipment (1000 Volts Maximum).
- I. NEMA MG 1 - Motors and Generators.

1.04 DESIGN / PERFORMANCE REQUIREMENTS

- A. Overhead coiling doors:
 - 1. Wind Loads: Design door assembly to withstand wind/suction load of 130 mph without damage to door or assembly components in conformance with ASTM E 330.
 - 2. Operation: Design door assembly, including operator, to operate for not less than 20,000 cycles.

SECTION 083300 – OVERHEAD COILING SERVICE DOORS (continued):

- B. Single-Source Responsibility: Provide doors, tracks, motors, and accessories from one manufacturer for each type of door. Provide secondary components from source acceptable to manufacturer of primary components.
- C. Products Requiring Electrical Connection: Listed and classified by Underwriters Laboratories, Inc. acceptable to authority having jurisdiction as suitable for purpose specified.

1.05 SUBMITTALS

- A. Submit under provisions of Section 013300.
- 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. Details of construction and fabrication.
 - 4. Installation instructions.
- C. Shop Drawings: Include detailed plans, elevations, details of framing members, anchoring methods, required clearances, hardware, and accessories. Include relationship with adjacent construction.
- D. Selection Samples: For each finish product specified, two complete sets of color chips representing manufacturer's full range of available colors and patterns.
- E. Verification Samples: For each finish product specified, two samples, minimum size 6 inches (150 mm) long, representing actual product, color, and patterns.
- F. Manufacturer's Certificates: Certify products meet or exceed specified requirements.
- G. Operation and Maintenance Data: Submit lubrication requirements and frequency, and periodic adjustments required.

1.06 QUALITY ASSURANCE

- A. Manufacturer Qualifications: Company specializing in performing Work of this section with a minimum of five years experience in the fabrication and installation of security closures.
- B. Installer Qualifications: Company specializing in performing Work of this section with minimum three years and approved by manufacturer.
- C. Samples:
 - 1. Finish areas designated by Architect.
 - 2. Do not proceed with remaining work until workmanship, color, and sheen are approved by Architect.

1.07 DELIVERY, STORAGE, AND HANDLING

- A. Store products in manufacturer's unopened packaging until ready for installation.
- B. Protect materials from exposure to moisture. Do not deliver until after wet work is complete and dry.

SECTION 083300 – OVERHEAD COILING SERVICE DOORS (continued):

- C. Store materials in a dry, warm, ventilated weathertight location.

1.08 PROJECT CONDITIONS

- A. Maintain environmental conditions (temperature, humidity, and ventilation) within limits recommended by manufacturer for optimum results. Do not install products under environmental conditions outside manufacturer's absolute limits.

1.09 COORDINATION

- A. Coordinate Work with other operations and installation of adjacent materials to avoid damage to installed materials.

1.10 WARRANTY

- A. Warranty: Manufacturer's limited door and operator system, except the counterbalance spring and finish, to be free from defects in materials and workmanship for 3 years or 20,000 cycles, whichever occurs first.
- B. Warranty: Manufacturer's limited door warranty for 2 years for all parts and components.

PART 2 – PRODUCTS

2.01 MANUFACTURERS

- A. Acceptable Manufacturer: Overhead Door Corp., 2501 S. State Hwy. 121, Suite 200, Lewisville, TX 75067. ASD. Tel. Toll Free: (800) 275-3290. Phone: (469) 549-7100 OR Capital City Overhead Doors, Mike Burns at (850) 866-9383 OR APPROVED EQUAL.
- B. Requests for substitutions will be considered in accordance with provisions of Section 012500.

2.02 OVERHEAD COILING SERVICE DOORS

- A. Overhead Coiling Stormtite Service Doors: Overhead Door Corporation Model 620.
 - 1. Curtain: Interlocking roll-formed slats as specified following. Endlocks shall be attached to each end of alternate slats to prevent lateral movement.
 - a. Flat profile type F-265i for doors up to 40 feet (12.19 m) wide.
 - b. Front slat fabricated of:
 - 1) 24 gauge galvanized steel (prime finish)
 - c. Back slat fabricated of:
 - 1) 24 gauge galvanized steel
 - 2. Performance:
 - a. Through Curtain Sound Rating: Sound Rating: STC-28 (STC-30+ with HZ noise generator) as per ASTM E 90.
 - b. Installed System Sound Rating: STC-21 as per ASTM E 90.
 - c. U-factor: 0.91 NFRC test report, maximum U-factor of no higher than 1.00.
 - d. Air Infiltration: Meets ASHRAE 90.1 & IECC 2012/2015 C402.4.3 Air leakage <1.00 cfm/ft².
 - 3. Finish:
 - a. Galvanized Steel: Slats and hood galvanized in accordance with ASTM A 653

SECTION 083300 – OVERHEAD COILING SERVICE DOORS (continued):

and receive rust-inhibitive, roll coating process, including 0.2 mils thick baked-on prime paint, and 0.6 mils thick baked-on polyester top coat.

- 1) Polyester Top Coat
 - a) Architect to select from standard colors.
 - 2) Non-galvanized exposed ferrous surfaces shall receive one coat of rust-inhibitive primer.
4. Weatherseals:
- a. Vinyl bottom seal, exterior guide and internal hood seals.
 - b. Interior guide weatherseal.
 - c. Lintel weatherseal.
 - d. Air Infiltration Package, IECC 2012/2015 listed; product to meet C402.4.3 2012 Air leakage <1.00 cfm/ft².
 - 1) Air infiltration perimeter seal package includes: guide cover, guide cap, dual brush exterior guide seal, 4 inch finned lintel brush seal and vinyl bottom seal.
5. Bottom Bar:
- a. Two galvanized steel angles minimum thickness 1/8 inch (3 mm) bolted back to back to reinforce curtain in the guides.
6. Guides: Three Structural steel angles.
- a. Finish: PowderGuard Weathered finish with iron/black powder.
 - b. Finish: PowderGuard Zinc Finish for guides, bottom bar and head plate.
7. Brackets:
- a. Galvanized steel to support counterbalance, curtain and hood.
8. Counterbalance: Helical torsion spring type housed in a steel tube or pipe barrel, supporting the curtain with deflection limited to 0.03 inch per foot of span.
9. Hood: Provide with internal hood baffle weatherseal.
- a. 24 gauge galvanized steel with intermediate supports as required.
 - b. Stainless steel, 24 gauge hood with intermediate supports as required.
10. Electric Motor Operation model RDB (with manual chain hoist): Provide UL listed electric operator, size as recommended by manufacturer to move door in either direction at not less than 2/3 foot nor more than 1 foot per second.
- a. Sensing Edge Protection:
 - 1) Electric sensing edge.
 - b. Operator Controls:
 - 1) Key operation with open, close, and stop controls (interior mount).
 - 2) Controls for interior location.
 - 3) Controls surface mounted (interior).
 - c. Special Operation:
 - 1) Exterior dual card reader control. Door ring stand alone proximity and dual pedestal (provide 50 cards).
 - 2) Sawcut loop for timer for free exit.
 - 3) Photo Eyes – NEMA 4.
 - 4) Explosion and dust ignition proof control wiring.
 - d. Motor Voltage: 115/230 single phase, 60 Hz.
11. Windload Design:
- a. Standard windload shall be 130 mph.

PART 3 – EXECUTION

3.01 EXAMINATION

- A. Verify opening sizes, tolerances and conditions are acceptable.
- B. Examine conditions of substrates, supports, and other conditions under which this work is to be

SECTION 083300 – OVERHEAD COILING SERVICE DOORS (continued):

performed.

- C. If substrate preparation is the responsibility of another installer, notify Architect of unsatisfactory preparation before proceeding.

3.02 **PREPARATION**

- A. Clean surfaces thoroughly prior to installation.
- B. Prepare surfaces using the methods recommended by the manufacturer for achieving the best result for the substrate under the project conditions.

3.03 **INSTALLATION**

- A. Install in accordance with manufacturer's instructions.
- B. Use anchorage devices to securely fasten assembly to wall construction and building framing without distortion or stress.
- C. Securely and rigidly brace components suspended from structure. Secure guides to structural members only.
- D. Fit and align assembly including hardware; level and plumb, to provide smooth operation.
- E. Coordinate installation of electrical service. Complete wiring from disconnect to unit components.
- F. Coordinate installation of sealants and backing materials at frame perimeter as specified in Section 079200.
- G. Install perimeter trim and closures.
- H. Instruct Owner's personnel in proper operating procedures and maintenance schedule.

3.04 **ADJUSTING**

- A. Test for proper operation and adjust as necessary to provide proper operation without binding or distortion.
- B. Adjust hardware and operating assemblies for smooth and noiseless operation.

3.05 **CLEANING**

- A. Clean curtain and components using non-abrasive materials and methods recommended by manufacturer.
- B. Remove labels and visible markings.
- C. Touch-up, repair or replace damaged products before Substantial Completion.

3.06 **PROTECTION**

- A. Protect installed products until completion of project.

END OF SECTION 083300

SECTION 084113 – ALUMINUM ENTRANCES AND STOREFRONTS

PART – GENERAL

1.01 SUMMARY

- A. Section Includes: Aluminum Storefront, including:
1. YKK AP Series YES 45 TU Center Set Storefront System.
- B. Related Sections:
1. Sealants: Refer to Division 7 Joint Treatment Section for sealant requirements.
 2. Glass and Glazing: Refer to Division 8 Glass and Glazing Section for glass and glazing requirements.

1.02 SYSTEM PERFORMANCE DESCRIPTION

- A. Performance Requirements: Provide aluminum storefront systems that comply with performance requirements indicated, as demonstrated by testing manufacturer's assemblies in accordance with test method indicated.
1. Air Infiltration: Completed storefront systems shall have 0.06 CFM/FT² (1.10 m³/h·m²) maximum allowable infiltration when tested in accordance with ASTM E 283 at differential static pressure of 6.24 PSF (299 Pa).
 2. Water Infiltration: No uncontrolled water when tested in accordance with ASTM E 331 at test pressure differential of: 10 PSF (479 Pa) (or when required, field tested in accordance with AAMA 503). Fastener Heads must be seated and sealed against Sill Flashing on any fasteners that penetrate through the Sill Flashing.
 3. Wind Loads: Completed storefront system shall withstand wind pressure loads normal to wall plane indicated:
 - a. Exterior Walls:
 - 1) Positive Pressure:
 - 2) Negative Pressure:
 - b. Interior Walls (Pressure Acting in Either Direction):
 4. Deflection: Maximum allowable deflection in any member when tested in accordance with ASTM E 330 with allowable stress in accordance with AA Specifications for Aluminum Structures.
 - a. Without Horizontals: L/175 maximum.
 - b. With Horizontals: L/175 or L/240 + 1/4" (6.4mm) for spans greater than 13'-6" (4.1m) but less than 40'-0" (12.2m).
 5. Thermal Movement: Provide for thermal movement caused by 180 degrees F. (82.2 degrees C.) surface temperature, without causing buckling stresses on glass, joint seal failure, undue stress on structural elements, damaging loads on fasteners, reduction of performance, or detrimental effects.
 6. Thermal Performance: When tested in accordance with AAMA 507, AAMA 1503 and NFRC 100:
 - a. Condensation Resistance Factor (CRF_f): A minimum of 60.
 - b. Thermal Transmittance -Factor: 0.45 BTU/HR/FT²/°F or less.Note: Thermal Performance for the glazed system as a whole will be affected by the characteristics of the glass specified and percentage of vision area.
 7. Acoustical Performance: When tested in accordance with AAMA 1801:
 - a. Sound Transmission Class (STC) shall not be less than 35 laminated.
 - b. Outdoor–Indoor Transmission Class (OITC) shall not be less than 29 laminated.

SECTION 084113 – ALUMINUM ENTRANCES AND STOREFRONTS (continued):

1.03 SUBMITTALS

- A. General: Prepare, review, approve, and submit specified submittals in accordance with "Conditions of the Contract" and Division 1 Submittals Sections. Product data, shop drawings, samples, and similar submittals are defined in "Conditions of the Contract."
- B. Product Data: Submit product data for each type storefront series specified.
- C. Substitutions: Whenever substitute products are to be considered, supporting technical data, samples, and test reports must be submitted ten (10) working days prior to bid date in order to make a valid comparison.
- D. Shop Drawings: Submit shop drawings showing layout, profiles, and product components, including anchorage, accessories, finish colors and textures.
- E. Samples: Submit verification samples for colors on actual aluminum substrates indicating full color range expected in installed system.
- F. Quality Assurance / Control Submittals:
 - 1. Test Reports: Submit certified test reports showing compliance with specified performance characteristics and physical properties.
 - 2. Installer Qualification Data: Submit installer qualification data.
- G. Closeout Submittals:
 - 1. Warranty: Submit warranty documents specified herein.
 - 2. Project Record Documents: Submit project record documents for installed materials in accordance with Division 1 Project Closeout (Project Record Documents) Section.

1.04 QUALITY ASSURANCE

- A. Qualifications:
 - 1. Installer Qualifications: Installer experienced (as determined by contractor) to perform work of this section who has specialized in the installation of work similar to that required for this project. If requested by Owner, submit reference list of completed projects.
 - 2. Manufacturer Qualifications: Manufacturer capable of providing field service representation during construction process.
- B. Mock-Ups (Field Constructed): Install at project site a job mock-up using acceptable products and manufacturer approved installation methods. Obtain Owner's and Architect's acceptance of finish color, and workmanship standard.
 - 1. Mock-Up Size:
 - 2. Maintenance: Maintain mock-up during construction for workmanship comparison; remove and legally dispose of mock-up when no longer required.
 - 3. Incorporation: Mock-up may be incorporated into final construction upon Owner's approval.
- C. Pre-Installation Meetings: Conduct pre-installation meeting to verify project requirements, substrate conditions, manufacturer's installation instructions, and manufacturer's warranty requirements.

SECTION 084113 – ALUMINUM ENTRANCES AND STOREFRONTS (continued):

1.05 PROJECT CONDITIONS / SITE CONDITIONS

- A. Field Measurements: Verify actual measurements/openings by field measurements before fabrication; show recorded measurements on shop drawings. Coordinate field measurements, fabrication schedule with construction progress to avoid construction delays.

1.06 WARRANTY

- A. Project Warranty: Refer to "Conditions of the Contract" for project warranty provisions.
- B. Manufacturer's Warranty: Submit, for Owner's acceptance, manufacturer's standard warranty document executed by an authorized company official.
1. Warranty Period: Manufacturer's one (1) year standard warranty commencing on the substantial date of completion for the project provided that the warranty, in no event, shall start later than six (6) months from the date of shipment by YKK AP America Inc.

PART 2 – PRODUCTS

2.01 MANUFACTURERS (Acceptable Manufacturers/Products)

- A. Acceptable Manufacturers:

YKK AP America Inc.
270 Riverside Parkway, Suite A
Austell, GA 30168
Telephone: (678) 838-6000; Fax: (678) 838-6001

1. Storefront System: YKK AP YES 45 TU Center Set Storefront System or Approved Equal.

- B. Storefront Framing System:

1. Description: Center set, exterior flush glazed; jambs and vertical mullions continuous; head, sill, intermediate horizontal attached by screw spline joinery or shear block attachment.
2. Components: Manufacturer's standard extruded aluminum mullions, 90 degree corner posts, entrance door framing, and indicated shapes.
3. Thermal Barrier: Provide continuous thermal barrier by means of a poured and debridged pocket consisting of a two-part, chemically curing high density polyurethane which is bonded to the aluminum by YKK ThermoBond Plus®. Systems employing non-structural thermal barriers are not acceptable.

2.02 MATERIALS

- A. Extrusions: ASTM B 221 (ASTM B 221M), 6063-T5 Aluminum Alloy.

- B. Aluminum Sheet:

1. Anodized Finish: ASTM B 209 (ASTM B 209M), 5005-H14 Aluminum Alloy, 0.050" (1.27 mm) minimum thickness.

SECTION 084113 – ALUMINUM ENTRANCES AND STOREFRONTS (continued):

2.03 ACCESSORIES

A. Manufacturer's Standard Accessories:

1. Fasteners: Zinc plated steel concealed fasteners; Hardened aluminum alloys or AISI 300 series stainless steel exposed fasteners.
2. Glazing: Setting blocks, edge blocks, and spacers in accordance with ASTM C 864, shore durometer hardness as recommended by manufacturer; Glazing gaskets in accordance with ASTM C 864.
3. 0.050 Aluminum Sill Flashing End Dams must have 3 point attachment.

2.04 RELATED MATERIALS (Specified in other Sections)

- A. Glass: Refer to Division 8 Glass and Glazing Section for glass materials.

2.05 FABRICATION

- A. Shop Assembly: Fabricate and assemble units with joints only at intersection of aluminum members with uniform hairline joints; rigidly secure, and sealed in accordance with manufacturer's recommendations.

1. Hardware: Drill and cut to template for hardware. Reinforce frames and door stiles to receive hardware in accordance with manufacturer's recommendations.
2. Welding: Conceal welds on aluminum members in accordance with AWS recommendations or methods recommended by manufacturer. Members showing welding bloom or discoloration on finish or material distortion will be rejected.

2.06 FINISHES AND COLORS

A. YKK AP America Anodized Plus® Finish:

CODE DESCRIPTION

* Indicates standard finish usually carried as inventory.

Anodized Plus® is an advanced sealing technology that completely seals the anodic film yielding superior durability (See AAMA 612).

- B. Anodized Finishing: Prepare aluminum surfaces for specified finish; apply shop finish in accordance with the following:

1. Anodic Coating: Electrolytic color coating followed by an organic seal applied in accordance with the requirements of AAMA 612. Aluminum extrusions shall be produced from quality controlled billets meeting AA-6063-T5.
 - a. Exposed Surfaces shall be free of scratches and other serious blemishes.
 - b. Extrusions shall be given a caustic etch followed by an anodic oxide treatment and then sealed with an organic coating applied with an electrodeposition process.
 - c. The anodized coating shall comply with all of the requirements of AAMA 612: Voluntary Specifications, Performance Requirements and Test Procedures for Combined Coatings of Anodic Oxide and Transparent Organic Coatings on Architectural Aluminum. Testing shall demonstrate the ability of the finish to resist damage from mortar, salt spray, and chemicals commonly found on construction sites, and to resist the loss of color and gloss.
 - d. Overall coating thickness for finishes shall be a minimum of 0.7 mils.
 - 1) CASS Corrosion Resistance Test, CASS 240/ASTM B368 Test Method.

SECTION 084113 – ALUMINUM ENTRANCES AND STOREFRONTS (continued):

- 2) Other AAMA 2605 Performance Tests specified in these specifications, such as: 7.3 Dry Film Hardness; 7.8.2 Salt Spray Resistance; 7.9.1.2 Color Retention, South Florida; 7.9.1.4 Gloss Retention, South Florida.

PART 3 – EXECUTION

3.01 MANUFACTURER'S INSTRUCTIONS / RECOMMENDATIONS

- A. Compliance: Comply with manufacturer's product data, including product technical bulletins, installation instructions, and product carton instructions. The latest installation manual is available at www.ykkap.com.

3.02 EXAMINATION

- A. Site Verification of Conditions: Verify conditions (which have been previously installed under other sections) are acceptable for product installation in accordance with manufacturer's instructions.

3.03 PREPARATION

- A. Adjacent Surfaces Protection: Protect adjacent work areas and finish surfaces from damage during product installation.
 1. Aluminum Surface Protection: Protect aluminum surfaces from contact with lime, mortar, cement, acids, and other harmful contaminants.

3.04 INSTALLATION

- A. General: Install manufacturer's system in accordance with shop drawings, and within specified tolerances.
 1. Protect aluminum members in contact with masonry, steel, concrete, or dissimilar materials using nylon pads or bituminous coating.
 2. Shim and brace aluminum system before anchoring to structure.
 3. Provide sill flashing at exterior storefront systems. Extend extruded flashing continuous with splice joints; set in continuous beads of sealant.
 4. Verify storefront system allows water entering system to be collected in gutters and wept to exterior. Verify metal joints are sealed in accordance with manufacturers installation instructions.
 5. Locate expansion mullions where indicated on reviewed shop drawings.
 6. Seal metal to metal storefront system joints using sealant recommended by system manufacturer.

3.05 FIELD QUALITY CONTROL

- A. Manufacturer's Field Services: Upon request, provide manufacturer's field service consisting of site visit for inspection of product installation in accordance with manufacturer's instructions.
- B. Field Test: Conduct field test to determine watertightness of storefront system. Conduct test in accordance with AAMA 501.2.

SECTION 084113 – ALUMINUM ENTRANCES AND STOREFRONTS (continued):

3.06 ADJUSTING AND CLEANING

- A. Adjusting: Adjust swing doors for operation in accordance with manufacturer's recommendations.
- B. Cleaning: The General Contractor shall clean installed products in accordance with manufacturer's instructions prior to owner's acceptance, and remove construction debris from project site. Legally dispose of debris.
- C. Protection: The General Contractor shall protect the installed product's finish surfaces from damage during construction.

END OF SECTION 084113

SECTION 085802 – ALUMINUM CASHIER WINDOW

PART 1 – GENERAL

1.01 SUMMARY

- A. This section includes:
 - 1. Aluminum cashier windows as indicated in drawings and in sections.

1.02 SUBMITTALS

- A. Product Data: Submit Manufacturer's technical product data substantiating that products comply.
- B. Shop drawings: Submit for fabrication and installation of windows. Include details, elevations and installation requirement of finish hardware and cleaning.
- C. Certification: Provide printed data in sufficient detail to indicate compliance with the contract documents

1.03 DELIVERY, STORAGE AND HANDLING

- A. Deliver windows crated to provide protection during transit and job storage.
- B. Inspect windows upon delivery for damage. Unless minor defects can be made to meet the Architect's specifications and satisfaction, damaged parts should be removed and replaced.
- C. Store windows at building site under cover in dry location.

1.04 PROJECT CONDITIONS

- A. Field measurements: Check opening by accurate field measurement before fabrication. Show recorded measurements on shop drawings. Coordinate fabrication schedule with construction progress to avoid delay of work.

1.05 WARRANTY

- A. All material and workmanship shall be warranted against defects for a period of one (1) year from the original date of purchase.

PART 2 PRODUCTS

2.01 ACCEPTABLE MANUFACTURERS

- A. Basis of design: Design is based on Aluminum Cashier Window, catalog number **SCW103N**, manufactured by **C.R. Laurence Co., Inc. (800) 421-6144 or equal**.

2.02 MATERIALS

- A. Frames: Aluminum cashier window frame to be 1.390" x .625" extruded aluminum. Overall frame size to be 30" W x 32"H (Includes 2" H stainless steel shelf.)
- B. Finish: All aluminum to be clear anodized.

SECTION 085802 – ALUMINUM CASHIER WINDOW (continued):

Glazing: ¼" Clear tempered Glass.

- C. Shelf: Provide a shelf not less than 2" thick with recessed deal tray. The shelf is to be the full width of the window and 18" deep centered under the glazing.
- D. Voice Transmission: Communication permitted by 834A no draft speak-thru centered in glazing.

PART 3 – EXECUTION

3.01 INSTALLATION

- A. Install frames and glazing in accordance with manufacturer's printed instructions and recommendations. Repair damaged units as directed (if approved by the manufacturer and the architect) or replace with new units.

3.02 CLEANING

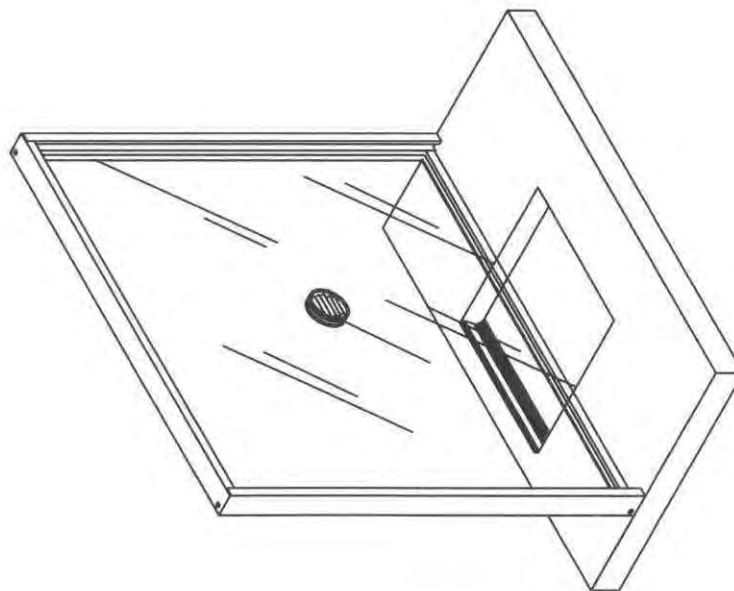
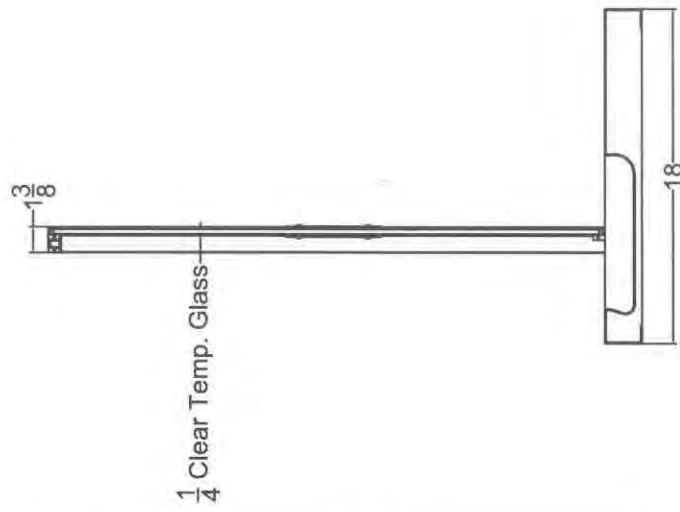
- A. Clean frame and glazing surfaces after installation, complying with requirements contained in the manufacturer's instructions. Remove excess glazing sealant compounds, dirt or other substances.

3.03 PROTECTION

- A. Institute protective measures required throughout the remainder of the construction period to ensure that all the windows do not incur any damage or deterioration, other than normal weathering, at the time of acceptance.

END OF SECTION 085802

CASHIER WINDOW CRL P/N SCW103N



TRANSACTION HARDWARE
C.R. Laurence Architectural Products
Phone Orders (800) 421-6144
Fax Orders (800) 262-3299
WWW.CRLAURENCE.COM
Patent Pending

SECTION 087100 - FINISH HARDWARE

PART 1 - GENERAL

1.01 DESCRIPTION OF WORK

- A. Work under this section consist of furnishing and installing items known commercially as builders hardware as specified in this section and noted on the drawings for a complete and operational system.
- B. Items include but are not limited to the following:
 - 1. Hinges
 - 2. Flush Bolts
 - 3. Coordinators
 - 4. Locks
 - 5. Exit Devices
 - 6. Door Closers
 - 7. Push Plates
 - 8. Door Pulls
 - 9. Protective Plates
 - 10. Door Stops and Holders
 - 11. Thresholds and Weather-stripping
 - 12. Silencers

1.02 RELATED DOCUMENTS

- A. Drawings and general provisions of contract, including General and Supplementary Conditions, and Division 1 Specification sections, apply to this section.

1.03 RELATED WORK

- A. Section 081113 - Hollow Metal Doors and Frames
- B. Section 081307 – Bullet-Resistant Wood Doors and Bolt-In Steel Door Frames
- B. Section 081416 – Flush Wood Doors
- C. Section 088000 – Glass and Glazing
- E. Section 099100 – Painting
- F. Division 16 - Electrical

1.04 QUALITY ASSURANCE

- A. Manufacturers and model numbers listed in Part 2 of this section have been set to establish a standard of quality, design and function. Only those manufacturers and model numbers listed herein as approved are to be furnished on this project. Obtain each type of hardware (Hinges, Locks, Exit Devices, Closers, etc.) from a single manufacturer, although several may be listed as acceptable.
- B. Substitutions: Only those products specifically listed in Part 2 of this section as approved or equal by manufacturer name and product number are acceptable. Substitutions will not be accepted unless a request is made in writing 10 prior to the published bid date and approved by addendum accepting the product substitution.

SECTION 087100 - FINISHED HARDWARE (continued):

- C. The Hardware supplier is to be a qualified direct distributor of the products to be furnished, and is to regularly engage in furnishing products on projects of similar size and requirements. In addition, the supplier is to have in their regular employment a Certified Architectural Hardware Consultant who will be made available at reasonable times to consult with the Architect, General Contractor and/or the owners representative regarding any matters that affect the project, inspect and direct detailing, applying, and adjusting of all hardware.
- D. Furnish Hardware for fire rated openings that meet NFPA 80 and the local building codes. Furnish only hardware that has been tested and listed by UL or FM for fire rated openings. All labeled doors to have ball bearing steel hinges, a door closer and a lockset to meet the requirements of NFPA 80. Where exit devices are specified or required on Fire Rated Doors furnish only those devices that have been tested and listed "FIRE EXIT HARDWARE."

1.05 **REFERENCES:** All hardware shall comply with the following:

- A. NFPA 80 Fire Doors and Windows 1995 Edition
- B. NFPA 101 Life Safety Code 1994 Edition
- C. NFPA 105 Installation of Smoke-Control Door Assemblies 1989 Edition
- D. ADA The Americans with Disabilities Act: Title III Public Accommodations and Florida Accessibility Code (FAC).
- E. ANSI A117.1: American National Standards Institute: Accessible and Usable Buildings and Facilities.
- F. ANSI : American National Standards Institute
- G. UFAS: Uniform Federal Accessibility Standards
- H. UL: Underwriter's Laboratories
- I. WHI: Warnock Hersey International
- J. DHI: Door and Hardware Institute
- K. BOCA: Basic Building Code
- L. NBC: National Building Code
- M. SBS: Southern Building Code
- N. UBC: Uniform Building Code

1.06 **SUBMITTALS**

- A. Submit schedules in accordance with Division 1, General Requirements and Contract Documents.
- B. **SCHEDULES:** Provide Finish Hardware Schedules detailing each opening individually within two weeks after receipt of purchase order. Use the Vertical format scheduling method as outlined in the DHI brochure "Sequence and Format for the Hardware Schedule". The horizontal format will not be allowed. Schedule each floor and each building separately. Separate fire rated doors and non rated doors using different headings. Separate doors of different sizes in headings that have all doors of the same size and like hardware. Provide 6 copies.

SECTION 087100 - FINISHED HARDWARE (continued):

- C. SAMPLES: Provide samples of the products listed in the Schedule as required by the Architect. Furnish 1 item that is representative of the manufacturers series that is being supplied.
- D. TEMPLATES: Within 1 week after receipt of an approved Hardware Schedule provide template information to related door and frame suppliers to prepare for the installation of mortise hardware and reinforcement of surface mounted hardware. Provide 3 copies for distribution.
- E. PRODUCT DATA: Together with the Finish Hardware Schedule provide catalog cuts highlighting each item that is being proposed, including appropriate ANSI/BHMA criteria and special mounting instructions. Provide 6 copies.
- F. KEYING SCHEDULE: Schedule a meeting with the Architect, General Contractor and/or the owners representative for keying information. Incorporate the keying information as outlined in DHI's manual "Keying Procedures, Systems and Nomenclature". Provide 6 copies.
- G. WIRING DIAGRAMS: Furnish custom wiring diagrams for electrified hardware interfacing all electrical components in point-to-point wiring diagrams and elevation drawings. Drawings are to show the door number, the location of all accessories such as power supplies, relays, junction boxes, wire type and size and wire runs. Provide 6 copies along with the Finish Hardware schedule. Meet with the Electrical Contractor and the installation team for proper coordination.
- H. CERTIFICATE OF COMPLIANCE: Submit a Certificate of Compliance from the manufacturer that the electronic hardware and systems being supplied comply with the operational descriptions exactly as described within this specification. Provide 3 copies.

1.07 DELIVERY, STORAGE AND HANDLING

- A. DELIVERY: Deliver hardware to the jobsite in the manufacturers original packages. Tag and mark each item of package to correspond with the door and heading number on the finish hardware schedule. Include installation instructions and custom wiring diagrams for electrified hardware. Inventory hardware jointly with a representative of the General contractor and the Hardware supplier until both are satisfied with the count.
- B. STORAGE: Store material in a dry, secured area, within the building, free from dust and dirt within a controlled environment.
- C. HANDLING: Provide strict control over access to the storage area so that completion of the work will not be delayed due to hardware losses.

1.08 WARRANTY

- A. Submit warranties in accordance with Division 1, General Requirements and Contract Documents. This requirement does not take the place of Division 1 requirements but is in addition to the Warranties and Bonds section. This warranty shall cover against defects in materials and workmanship, commencing with substantial completion of the project. Supplier is to furnish written warranties meeting the requirements of this section along with the hardware submittals.
 - 1. All Finish Hardware 1 Year
 - 2. Locks 5 Years
 - 3. Exit Devices 5 Years
 - 4. Door Closers 10 Years

PART 2- PRODUCTS

SECTION 087100 - FINISHED HARDWARE (continued):

2.01 ACCEPTABLE MANUFACTURERS AND PRODUCTS: Provided that each manufacturer meets these specification:

- A. HINGES: Provide hinges as specified in the hardware sets listed at the end of this section. Furnish three knuckle, full mortise type. At exterior doors furnish non-ferrous hinges with non-removable pins. Hinges for doors with door closers shall have ball bearings. Provide Lifetime Warranty.

Specified manufacturer: Stanley
Approved Manufacturers: Ives, Hager
S

- B. LOCKS AND CYLINDERS Provide locks of the type and function listed in the Hardware sets listed at the end of this section. Locks shall have solid levers and wrought roses on both sides. Independent lever housing shall have built-in lever support springs for both inside and outside lever. Locks must have ability to be reversed without disassembly. At exterior doors and pairs of doors, provide a latch with 3/4" throw. Provide a 5-year warranty.

Locks
Specified Manufacturer: BEST
Acceptable Manufacturers: SCHLAGE
SARGENT

Cylinders
Specified Manufacturer: BEST
Acceptable Manufacturers: NO SUBSTITUTE

- C. EXIT DEVICES: NOT USED

- D. DOOR CLOSERS: Furnish door closers of the type listed in the Hardware Sets at the end of this section. Closers are to have close-grained annealed *cast iron bodies* and meet or exceed ANSI A156.4 Grade 1 requirements. Closers shall have arm type listed and have independent valve adjustments for back check, closing and latching speeds. Provide adjustable units complying with ANSI A117.1 provisions for door opening force and delayed action closing. Provide 10-year warranty.

Specified Manufacturer: STANLEY
Acceptable Manufacturers: CORBIN/RUSSWIN
LCN

- E. OVERHEAD STOPS: NOT USED

- F. STOPS, LATCH PROTECTORS, PUSH PLATES, PULL PLATES, KICK PLATES, SILENCERS: Furnish these products in quality, design and function in accordance with those listed in the Hardware Sets at the end of this section. Provide 1-year warranty.

Specified Manufacturer: ROCKWOOD
Acceptable Manufacturers: IVES
TRIMCO

SECTION 087100 - FINISHED HARDWARE (continued):

- G. WEATHERSTRIP & THRESHOLDS: Furnish products in quality, design and function and in accordance with those listed in the Hardware Sets at the end of this section. Provide 1-year warranty.

Acceptable Manufacturers: NATIONAL GUARD
HAGER
PEMKO

2.02 FINISHES

HINGES, EXTERIOR	630
HINGES, INTERIOR	652
LOCKSETS	626
CLOSERS	689
DOOR TRIM	626
PROTECTION PLATES	630
THRESHOLDS	AL

2.03 KEYING

- A. Provide Best Locking Systems interchangeable core cylinders with Visual Key Control and keyed to a new master key as directed by the owner. Furnish temporary construction cores for use during construction. All locks are to be factory keyed and a bitting list provided to the owner at project completion. Provide with 6 or 7 pins as required by the Architect. Furnish keys in the following quantities;

2	EA	Change Keys per lock
6	EA	Master Keys for each system used
6	EA	Grand Master Keys
12	EA	Construction Keys
100	EA	Key blanks

- B. Send all permanent cores and keys directly from the manufacturer to the owner by registered mail.

2.04 KEY CONTROL

- A. KEY CABINET: Provide a key cabinet similar to model AWC as manufactured by Telkee with a capacity of one hook per cylinder plus an additional 50 percent expansion.

PART 3 - EXECUTION

3.01 INSPECTION:

- A. After installation has been completed a representative of the hardware supplier is to inspect the installation of the finish hardware to ensure that each item of hardware is operating properly and installed according to the approved hardware schedule.

3.02 INSTALLATION:

- A. Mount hardware units at heights indicated in "Recommended Locations for Builders Hardware for Standard Steel Doors and Frames" by the Door and Hardware Institute except as specifically indicated or required to comply with governing regulations, and as may be indicated otherwise by the Architect.

SECTION 087100 - FINISHED HARDWARE (continued):

- B. Install each hardware item in compliance with the manufacturer's instructions and recommendations (failure to install hardware correctly and to make proper adjustments will result in monetary penalties applied to the installation team to correct improper installation). Wherever cutting and fitting is required to install hardware onto or into surfaces which are later to be painted or finished, coordinate removal, storage and reinstallation of items. Do not install surface mounted hardware until finishes have been applied.
- C. Set units level, plumb and true. Adjust and reinforce the surface material as necessary for proper installation and operation.
- D. Drill and countersink units that are not factory prepared for anchors and fasteners.
- E. Set thresholds for exterior doors in full bed of butyl-rubber or polyisobutylene mastic sealant to completely fill voids and exclude moisture. Remove excess sealant.

3.03 ADJUSTING AND CLEANING

- A. Adjust and check each operating item of hardware at each door to ensure proper operation and function. Replace units that cannot be adjusted to operate freely as intended. Make final adjustments to door closers and floor closers to ensure that all valves are set properly for proper functioning of the door.
- B. After installation and before turning the building over all hardware shall be left clean and free from dirt, dust or disfigurement.
- C. Instruct the owners personnel in the proper adjustment and maintenance of hardware and electrical security systems. Turn over installation instructions, final approved finish hardware schedules, custom wiring diagrams and any special tools that were required for installation.

3.04 PROTECTION

- A. The General contractor shall be responsible for protecting all hardware and finishes of each item of hardware until the owner accepts the project as complete.

3.05 EXTRA STOCK

- A. At the completion of the project, supply to the Owner the following items:

Complete bitting list of keys cut:

- 2 sets of instruction sheets for each item furnished.
- 2 each of any non-standard tool for installation of items furnished.
- 2 sets of standard tools for installation of items furnished.

3.06 PROVIDE FINISH HARDWARE AS SPECIFIED IN THE PREVIOUS ARTICLES IN SETS ACCORDING TO THE FOLLOWING SCHEDULE.

SECTION 087100 - FINISHED HARDWARE (continued):

HARDWARE SET 1

Door 100

3 ea	HINGES	FBB191 4.5 x 4.5 NRP	630	STA
1 ea	DORM LOCK	47H7TD15H	630	BES
1 ea.	CLOSER-STOP ARM	QDC119 X SNB	689	STA
1 ea	THRESHOLD	896V X LAR	AL	N-G
1 ea	DOOR SWEEP	35VA x LAR	AL	N-G
1 ea	WEATHERSTRIP	160V X LAR	AL	N-G

HARDWARE SET 2

Doors 109, 110, 111

3 ea	HINGES	FBB191 4.5 x 4.5 NRP	630	STA
1 ea	STORE ROOM LOCK	45H7D15H	630	BES
1 ea.	CLOSER – HO STOP ARM	QDC120 X SNB	689	STA
1 ea	THRESHOLD	896V X LAR	AL	N-G
1 ea	DOOR SWEEP	35VA x LAR	AL	N-G
1 ea	WEATHERSTRIP	160V X LAR	AL	N-G

HARDWARE SET 3

Door 130

3 ea	HINGES	FBB199 4.5 x 4.5 NRP	630	STA
1 ea	ENTRY LOCK	47H7AB15H	630	BES
1 ea	ELECTRIC STRIKE	8500 X 2005M3	630	HES
1 ea	AUTO. DOOR OPERATOR	SW100 LOW ENERGY	689	BES
1 ea	DIGITAL WIRELESS TRANSMITTERS/RECEIVERS			BES
1 ea	THRESHOLD	896V X LAR	AL	N-G
1 ea	DOOR SWEEP	35VA x LAR	AL	N-G
1 ea	WEATHERSTRIP	160V X LAR	AL	N-G

HARDWARE SET 4

Doors C100, 111B, 117C

2 ea	HINGES	FBB199 4.5 x 4.5 NRP	630	STA
1 ea	HINGES	CEFBB199 4.5 x 4.5 NRP	630	STA
1 ea	ELECTRONIC LOCK	47HW7TDEU-C-RQE-15H	630	BES
1 ea.	CLOSER-STOP ARM	QDC119 X SNB	689	STA
1 ea	POWER SUPPLY	8W599		STA
1 ea	RECTIFIER	8WCON		STA
1 ea	TEMP. CONTROL MODULE	8WTCM		STA
1 ea	CARD READER	Furnished By Security Integrator		B-O
1 ea	THRESHOLD	896V X LAR	AL	N-G
1 ea	DOOR SWEEP	35VA x LAR	AL	N-G
1 ea	WEATHERSTRIP	160V X LAR	AL	N-G

SECTION 087100 - FINISHED HARDWARE (continued):

HARDWARE SET 5

Door 117

5 ea	HINGES	FBB199 4.5 x 4.5 NRP	630	STA
1 ea	HINGES	CEFBB199 4.5 x 4.5 NRP	630	STA
1 ea	ELECTRONIC LOCK	47HW7TDEU-C-RQE-15H	630	BES
2 ea	CLOSER – HO/STOP ARM	QDC120 X SNB	689	STA
1 ea	POWER SUPPLY	8W599		STA
1 ea	RECTIFIER	8WCON		STA
1 ea	TEMP. CONTROL MODULE	8WTCM		STA
1 set	AUTOMATIC FLUSHBOLTS	2842	626	ROC
1 ea	COORDINATOR	1600 x LAR x FB X Mtg, Brkts	PC	ROC
1 ea	CARD READER	Furnished By Security Integrator		B-O
1 ea	THRESHOLD	896V X LAR	AL	N-G
2 ea	DOOR SWEEP	35VA x LAR	AL	N-G
1 ea	WEATHERSTRIP	160V X LAR	AL	N-G

HARDWARE SET 6

Doors 101, 113, 122, 127, 135

3 ea	HINGES	FBB179 4.5 x 4.5	652	STA
1 ea	STORE ROOM LOCK	9K7D 15C	626	BES
1 ea.	CLOSER	QDC111 X SNB	689	STA
1 ea	DOOR STOP	409/443 as required	626	ROC

HARDWARE SET 7

Doors C101, 114, 128, 128A, 129

2 ea	HINGES	FBB179 4.5 x 4.5	652	STA
1 ea	HINGES	CEFBB179 4.5 x 4.5	652	STA
1 ea	ELECTRONIC LOCK	9KW37DEU-C-RQE 15C	626	BES
1 ea.	CLOSER	QDC111 X SNB	689	STA
1 ea	POWER SUPPLY	8W599		STA
1 ea	RECTIFIER	8WCON		STA
1 ea	TEMP. CONTROL MODULE	8WTCM		STA
1 ea	CARD READER	Furnished By Security Integrator		B-O
1 ea	KICK PLATE	10" x 2" LDW x .050"	630	ROC
1 ea	DOOR STOP	409/443 as required	626	ROC

HARDWARE SET 8

Doors 105, 106, 112

3 ea	HINGES	FBB179 4.5 x 4.5	652	STA
1 ea	PASSAGE SET	9K0N 15C	626	BES
1 ea	DOOR STOP	409/443 as required	626	ROC

HARDWARE SET 9

Doors 102, 103, 121, 134

3 ea	HINGES	FBB179 4.5 x 4.5	652	STA
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SECTION 087100 - FINISHED HARDWARE (continued):

1 ea	OFFICE LOCK	9K7AB 15C	626	BES
1 ea	DOOR STOP	409/443 as required	626	ROC

HARDWARE SET 10

Doors 131, 132

3 ea	HINGES	FBB179 4.5 x 4.5	652	STA
1 ea	PRIVACY SET	9K0L 15C	626	BES
1 ea	CLOSER	QDC111 X SNB	689	STA
1 ea	KICK PLATE	10" x 2" LDW x .050"	630	ROC
1 ea	MOP PLATE	6" x 1" LDW x .050"	630	ROC
1 ea	DOOR STOP	409/443 as required	626	ROC

HARDWARE SET 11

Doors C100A, 104, 126

3 ea	HINGES	FBB179 4.5 x 4.5	652	STA
1 ea	CLASS ROOM LOCK	9K7R 15C	626	BES
1 ea	CLOSER	QDC111 x SNB	689	STA
1 ea	DOOR STOP	409/443 as required	626	ROC

HARDWARE SET 12

Doors 107, 108

3 ea	HINGES	FBB179 4.5 x 4.5	652	STA
1 ea	PUSH PLATE	70E 8" x 16"	630	ROC
1 ea	PULL PLATE	125 x 70C 4" x 16"	630	ROC
1 ea	CLOSER	QDC111 x SNB	689	STA
1 ea	KICK PLATE	10" x 2" LDW x .050"	630	ROC
1 ea	MOP PLATE	6" x 1" LDW x .050"	630	ROC
1 ea	DOOR STOP	409/443 as required	626	ROC

HARDWARE SET 13

Door 111A

3 ea	HINGES	FBB179 4.5 x 4.5	652	STA
1 ea	PASSAGE SET	9K0N 15C	626	BES
1 ea	CLOSER	QDC111 X SNB	689	STA
1 ea	KICK PLATE	10" x 2" LDW x .050"	630	ROC
1 ea	DOOR STOP	409/443 as required	626	ROC

HARDWARE SET 14

Door 116A

2 ea	HINGES	FBB179 4.5 x 4.5	652	STA
1 ea	HINGES	CEFBB179 4.5 x 4.5	652	STA
1 ea	ELECTRONIC LOCK	9KW37DEU-C-RQE 15C	626	BES
1 ea	CLOSER	QDC111 X SNB	689	STA

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15103 - V.E. Set

087100-9

SECTION 087100 - FINISHED HARDWARE (continued):

1 ea	POWER SUPPLY	8W599		STA
1 ea	RECTIFIER	8WCON		STA
1 ea	TEMP. CONTROL MODULE	8WTCM		STA
1 ea	CARD READER	Furnished By Security Integrator		B-O
1 ea	KICK PLATE	10" x 2" LDW x .050"	630	ROC
1 ea	DOOR STOP	409/443 as required	626	ROC
1 ea	THRESHOLD	427E x LAR	AL	N-G
1 ea	AUTOMATIC DOOR BOTTOM	220NA x LAR	AL	N-G
1 set	WEATHERSTRIP	160V x LAR (Head & Jambs)	AL	N-G

HARDWARE SET 15

Door 119

2 ea	HINGES	FBB191 4.5 x 4.5	630	STA
1 ea	HINGES	CEFBB191 4.5 x 4.5	630	STA
1 ea	ELECTRONIC LOCK	9KW37DEU-C-RQE 15C	626	BES
1 ea	CLOSER W/ STOP ARM	QDC119 X SNB	689	STA
1 ea	POWER SUPPLY	8W599		STA
1 ea	RECTIFIER	8WCON		STA
1 ea	TEMP. CONTROL MODULE	8WTCM		STA
1 ea	CARD READER	Furnished By Security Integrator		B-O
1 ea	THRESHOLD	425E x LAR	AL	N-G
1 set	WEATHERSTRIP	160V x LAR (Head & Jambs)	AL	N-G

HARDWARE SET 16

Door 118

3 ea	HINGES	FBB179 4.5 x 4.5	652	STA
1 ea	PRIVACY SET	9K0L 15C	626	BES
1 ea	CLOSER W/ STOP ARM	QDC119 X SNB	689	STA
1 ea	THRESHOLD	425E x LAR	AL	N-G
1 set	WEATHERSTRIP	160V x LAR (Head & Jambs)	AL	N-G

HARDWARE SET 17

Door 130A

2 ea	HINGES	FBB168 4.5 x 4.5 NRP	652	STA
1 ea	HINGES	CEFBB168 4.5 x 4.5 NRP	652	STA
1 ea	ELECTRONIC LOCK	47HW7TDEU-C-RQE-15H	630	BES
1 ea	CLOSER - STOP ARM	QDC119 X SNB	689	STA
1 ea	POWER SUPPLY	8W599		STA
1 ea	RECTIFIER	8WCON		STA
1 ea	TEMP. CONTROL MODULE	8WTCM		STA
1 ea	CARD READER	Furnished By Security Integrator		B-O

END OF SECTION 087100

SECTION 088000 - GLASS AND GLAZING

PART 1 - GENERAL

- 1.01 Glazing Standard: Comply with FGMA "Glazing Manual" and "Sealant Manual".
- 1.02 Safety Glazing Standard: Comply with ANSI Z97.1 and testing requirements of 16 CFR Part 1201 for category II materials.
- 1.03 Fire-Protection-Rated Glazing Labeling: Permanently mark fire-protection-rated glazing with certification label of a testing agency acceptable to authorities having jurisdiction. Label shall indicate manufacturer's name, test standard, whether glazing is for use in fire doors or other openings, whether or not glazing passes hose-stream test, whether or not glazing has a temperature rise rating of 450 deg F (250 deg C), and the fire-resistance rating in minutes.
- 1.04 Submittals: In addition to product data submit samples of each glass indicated (except for clear single pane units) and tint color.

PART 2 - PRODUCTS

- 2.01 Glass Manufacturers: Subject to compliance with requirements, provide products by one of the following:
- | | |
|----------------------------|---------------------|
| Falconer Glass Industries. | Pilkington Sales |
| Oldcastle Glass, Inc. | PPG Industries Inc. |
| Guardian Industries Corp. | |
- 2.02 Sizes: Fabricate glass of thicknesses indicated and to sizes required for glazing openings indicated, with edge clearances and tolerances complying with recommendations of glass manufacturer.
- 2.03 Primary Glass Products: Comply with ASTM C 1036 for the following:
- A. Clear Float Glass: Type I, Class 1, Quality q3.
- B. Energy Efficient Low E, Tinted Float Glass: Solarban ®60 OR APPROVED EQUAL; Type I, Class 2, Quality q3. of manufacturer's standard tint with U-value of .29 winter nighttime / .27 summer daytime, and shading coefficient of .20.
- Outboard Lite: Solar cool, solar gray (heat strengthened)
Inboard Lite: Solarban 60.
- C. Mirror Units: 1/4" thick, tempered mirrors at locations and sizes indicated on the drawings.
- D. Exterior frosted glass as shown on the plans.
- 2.05 Fire-Rated Glazing: Provide "Superlite II" by SAFTI complying with the following requirements: 60 min. rating per ASTM E2074, WHI 495-0608, UL R 10665-3, 450° temperture rise rating OR approved equal.
- 2.06 Uncoated Heat-Treated Glass Products: Comply with ASTM C 1048 and with manufacturing process indicated for the following:
- A. Clear Tempered Float Glass: Kind FT, Condition A, Type I, Class 1, Quality q3.
- B. Tinted Tempered Float Glass: Kind FT, Condition A, type I, Class 1, Quality q3 of manufacturer's standard tint with U-value of 1.10 and shading coefficient of .66.
- 2.07 Sealed Insulating Glass Units, General: Comply with requirements of ASTM E 774 for Class A units and

SECTION 088000 - GLASS AND GLAZING (continued):

the following:

- A. Performance characteristics indicated are those of units and are based on manufacturer's published test data for units with 1/4" thick panes and 1/2" thick air space. U-values are indicated in Btu per hr. per sq. ft. per deg. F difference.
- B. For properties of individual glass panes making up units, refer to product requirements specified elsewhere in this section applicable to types, classes, kinds and conditions of glass products indicated.
- C. Provide heat-treated panes of kind indicated and as recommended by glass manufacturer for application indicated.

Thickness of Each Pane: 1/4".

Air Space Thickness: 1/2".

Sealing System: Manufacturer's standard.

Spacer Material: Manufacturer's standard metal.

- 2.08 Glazing Sealant: Comply with sealant and glass manufacturers for selection of glass sealants which suit project application and installation conditions and which are compatible with surfaces contacted. Provide color of exposed sealants indicated or as selected by Architect.
- 2.09 Dense Elastomeric Compression Seal Gaskets: ASTM C 864, extruded or molded neoprene, EPDM, or thermoplastic polyolefin rubber.
- 2.10 Cellular Elastomeric Preformed Gaskets: ASTM C 509, Type II, black; extruded or molded neoprene.
- 2.11 Cleaners, Primers and Sealers: Type recommended by manufacturer of sealants/gaskets.
- 2.12 Blocks and Spacers: Neoprene, EPDM or silicone as required for compatibility with glazing sealants; of 80 to 90 Shore A hardness for setting blocks and, for spacers and edge blocks, of hardness recommended by glass and sealant manufacturer for application indicated.
- 2.13 Compressible Filler Rods: Closed-cell or waterproof-jacketed rod stock of synthetic rubber or plastic foam, 5-10 psi compression strength for 25 percent compression.

PART 3 - EXECUTION

- 3.01 Glass Installation (Glazing): Comply with referenced FGMA standards and instructions of manufacturers of glass, glazing sealants, and gaskets, to achieve airtight and watertight performance, and to minimize breakage.
- 3.02 Protect glass from edge damage during handling and installation. Inspect glass during installation and discard pieces with edge damage that could affect glass performance.
- 3.03 Set units of glass in each series with uniformity of pattern, draw, bow and similar characteristics.
- 3.04 Protect glass from contact with contaminating substances resulting from construction operations; remove any such substances by method approved by glass manufacturer.
- 3.05 Wash glass on both faces not more than 4 days prior to date scheduled for inspections intended to establish date of substantial completion. Wash glass by method recommended by glass manufacturer.

END OF SECTION 088000



Solarban® 60 solar control, low-e glass by PPG was engineered to control solar heat gain, which is essential to minimizing cooling costs. In a standard one-inch insulating glass unit (IGU), **Solarban® 60** glass offers an exterior appearance similar to clear, uncoated glass.

With a very good Solar Heat Gain Coefficient (SHGC) of 0.39, **Solarban® 60** glass blocks 66 percent of the total solar energy while allowing 70 percent of the visible light to pass through. This combination produces an excellent Light to Solar Gain (LSG) ratio of 1.79, along with exceptional insulating performance, as evidenced by its 0.29 winter nighttime U-value.

Aesthetic Options

Solarban® 60 glass can be coated on **Starphire®** glass and paired with **Starphire®** glass to produce an IGU with exceptional clarity and solar control characteristics. For even more color and performance options, it can be coated on the second (#2) surface of nearly all PPG's wide range of tinted glasses, or combined in an IGU with any PPG tinted glass, **Solarcool®** reflective glass or **Vistacool®** subtly reflective, color-enhanced glass (see performance data on back page).

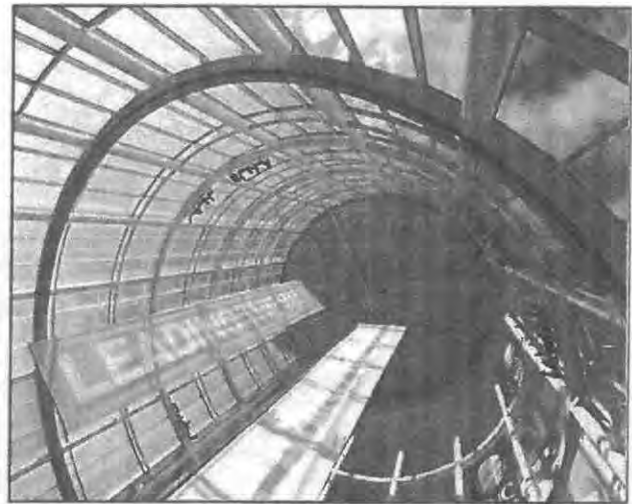
Solarban® 60 Glass and Sustainable Design

An energy modeling study conducted by an independent energy design and consulting firm showed that architects and building owners can potentially save millions of dollars during a building's lifetime by specifying **Solarban® 60** glass instead of less advanced architectural glazings.

For instance, the study showed that, by substituting **Solarban® 60** glass in place of dual-pane tinted glass, the owners of a typical glass-walled, eight-story office building in Boston could lower their initial HVAC equipment costs by nearly \$350,000 while realizing annual energy savings of more than \$80,000. Corresponding carbon emissions from the same building were also reduced by more than 300 tons per year, which eclipses the total carbon emissions generated by 31,000 gallons of gasoline.

In addition to making products that support sustainable design, PPG has pioneered innovative technologies that reduce energy consumption during the glass-making process. PPG promotes environmentally responsible manufacturing by recovering and reusing virtually all of its glass manufacturing by-products and by shipping its materials on reusable steel racks. PPG also facilitates regional sourcing through its nationwide network of certified glass fabricators and laminators.

With **Solarban® 60** glass, sustainable design and LEED® credit opportunities are provided according to the following criteria:



*Prudential Center
Location: Newark, NJ
Product: Solarban 60 Glass
Architect: Morris Adjmi Architects
Glass Contractor: Jasloff Glass
Glass Fabricator: J.E. Berkowitz, LP*



*Streeter Place
Location: Chicago, IL
Product: Solarban 60 Glass
Architect: Solomon Cordwell Buenz and Associates
Owner/Developer: Golub and Company
Glass Fabricator: Northwestern Industries, Inc.
Glazing Contractor: Custom Windows and J&D Erectors*

LEED / Green Design Category	Feature	Benefit
Optimizing Energy Performance Daylight & Views	Excellent SHGC, U-value, and Tvis performance High VLT	Enhance energy performance of building design Connectivity to natural lighting and the outdoors
Innovation in Design	Cradle to Cradle Certification™	Selection of environmentally-focused product evaluation



Fabrication and Availability
Solarban® 60 glass is available exclusively through the **PPG Certified Fabricator® Network**. PPG Certified Fabricators can meet tight construction deadlines and accelerate the delivery of replacement glass before, during and after construction. **Solarban® 60** glass is manufactured using the sputter-coating process and is available for annealed, heat-strengthened and tempered applications.

Solarban® 60 glass is just one of many **ecological Solutions from PPG™**. For more information, or to obtain samples of this product, call 888-PPG-IDEA (774-4332), or visit www.ppgideascales.com.

PPG is the first U.S. float glass manufacturer to have its products recognized by the **Cradle to Cradle Certified™** program, and it offers more C2C-certified architectural glasses than any other float glass manufacturer.

PPG IdeaScapes® Integrated products, people and services to inspire your design and color vision.

Additional Resources

Solarban® 60 Glass Performance — Commercial Insulating Glass Unit Comparisons Using 1/4" (6mm) Glass

Glass Type	Insulating Vision Unit Performance Comparisons — 1-inch (25mm) units with 1/2-inch (13mm) airspace and two 1/4-inch (6mm) lites; as shown below											
	Transmittance			Reflectance		U-Value (Imperial)		European U-Value	Shading Coefficient	Solar Heat Gain Coefficient	Light to Solar Gain (LSG)	
	Ultra-violet %	Visible %	Total Solar Energy %	Visible Light %	Total Solar Energy %	Winter Night-time	Summer Day-time					
SOLARBAN® 60 Solar Control Low-E Glass												
SOLARBAN 60 (2) Clear + Clear	18	70	34	11	28	0.29	0.27	1.6	0.45	0.39	1.79	
SOLARBAN 60 (2) STARPHIRE*	24	74	39	11	41	0.29	0.27	1.6	0.48	0.41	1.80	
SOLARBAN 60 (2) ATLANTICA + Clear	5	53	20	8	7	0.29	0.27	1.6	0.32	0.27	1.96	
SOLARBAN 60 (2) AZURIA + Clear	13	54	21	8	6	0.29	0.27	1.6	0.32	0.28	1.93	
SOLARBAN 60 (2) OPTIGRAY + Clear	10	50	23	8	14	0.29	0.27	1.5	0.35	0.30	1.67	
SOLARBAN 60 (2) PACIFICA + Clear	5	34	15	6	6	0.29	0.27	1.6	0.26	0.22	1.55	
SOLARBAN 60 (2) SOLARBLUE + Clear	10	45	21	7	12	0.29	0.27	1.6	0.33	0.28	1.61	
SOLARBAN 60 (2) SOLARBRONZE + Clear	8	42	21	7	15	0.29	0.27	1.6	0.32	0.28	1.50	
SOLARBAN 60 (2) SOLARGRAY + Clear	8	35	18	6	12	0.29	0.27	1.6	0.29	0.25	1.40	
SOLARBAN 60 (2) SOLEXIA + Clear	10	61	25	9	10	0.29	0.27	1.6	0.37	0.32	1.91	
ATLANTICA® + SOLARBAN 60 (3) Clear	5	53	20	9	7	0.29	0.27	1.6	0.36	0.31	1.71	
AZURIA® + SOLARBAN 60 (3) Clear	13	54	21	9	7	0.29	0.27	1.6	0.36	0.31	1.74	
GRAYLITE® II + SOLARBAN 60 (3) Clear	1	7	4	4	5	0.29	0.27	1.6	0.14	0.13	0.54	
OPTIGRAY® + SOLARBAN 60 (3) Clear	10	50	23	8	15	0.29	0.27	1.5	0.40	0.35	1.43	
PACIFICA® + SOLARBAN 60 (3) Clear	5	34	15	6	7	0.29	0.27	1.6	0.29	0.25	1.36	
SOLARBLUE® + SOLARBAN 60 (3) Clear	10	45	21	7	13	0.29	0.27	1.6	0.38	0.33	1.36	
SOLARBRONZE® + SOLARBAN 60 (3) Clear	8	42	21	7	16	0.29	0.27	1.6	0.37	0.32	1.31	
SOLARGRAY® + SOLARBAN 60 (3) Clear	8	35	18	7	13	0.29	0.27	1.6	0.33	0.29	1.21	
SOLEXIA® + SOLARBAN 60 (3) Clear	10	61	25	10	10	0.29	0.27	1.6	0.42	0.37	1.65	
VISTACOOL® Glass with SOLARBAN® 60 Solar Control Low-E (3)												
VISTACOOL (2) AZURIA + Low-E	11	42	16	20	11	0.29	0.27	1.6	0.30	0.26	1.62	
VISTACOOL (2) PACIFICA + Low-E	4	26	12	11	9	0.29	0.27	1.6	0.25	0.21	1.24	
SOLARCOOL® Glass (Reflective) with SOLARBAN® 60 Solar Control Low-E (3)												
SOLARCOOL (2) AZURIA + Low-E	4	21	8	19	10	0.29	0.27	1.6	0.19	0.17	1.24	
SOLARCOOL (2) PACIFICA + Low-E	2	13	6	10	8	0.29	0.27	1.6	0.17	0.15	0.87	
SOLARCOOL (2) SOLARBLUE + Low-E	3	17	9	14	15	0.29	0.27	1.6	0.21	0.18	0.94	
SOLARCOOL (2) SOLARBRONZE + Low-E	2	17	9	14	18	0.29	0.27	1.6	0.21	0.18	0.94	
SOLARCOOL (2) SOLARGRAY + Low-E	2	14	8	11	14	0.29	0.27	1.6	0.20	0.17	0.82	
SOLARCOOL (2) SOLEXIA + Low-E	3	24	10	24	15	0.29	0.27	1.6	0.22	0.19	1.26	

* Data based on using STARPHIRE® glass for both interior and exterior lites.

All performance data calculated using LBNL Window 6.3 software, except European U-value, which is calculated using WinDat version 3.0.1 software. For detailed information on the methodologies used to calculate the aesthetic and performance values in this table, please visit www.ppgideascales.com or request our Architectural Glass Catalog.

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 7071 09/14 10M

SECTION 090160 – MAINTENANCE OF FLOORING – FLOORING RESTORATION

PART 1 GENERAL

1.01 SUMMARY

- A. Provide all labor, equipment and materials required to install an alkali-resistant, 100% solids epoxy concrete floor sealer that effectively stops moisture related problems with floor coverings. The contractor shall repair all concrete surfaces as shown on contract drawings or as specified herein prior to the installation of the concrete floor sealer.

1.02 REFERENCES

- ASTM E96-05- “Standard Test Method for Water Vapor Transmission of Materials”
- ASTM F 710 – “Preparing Concrete Floors to Receive Resilient Flooring; Section 5.3 pH testing”.
- ASTM F 2170 – “Determining Relative Humidity in Concrete Floor Slabs Using in situ Probes”.
- ASTM F 2420 – “Determining Relative Humidity on the Surface of Concrete Floor Slabs Using Relative Humidity Probe Measurement and Insulated Hood
- ASTM C-881, “Specification for Epoxy Resin Base Bonding Systems for Concrete”
- ASTM C-882, “Test Method for Bond Strength of Epoxy Resin Systems Used with Concrete”
- ACI 302.1R-89, “Guide for Concrete Floor and Slab Construction”
- ACI 318-89, Section 12, “Development and Splices of Reinforcement”
- ACI 504 R-90, “Guide to Sealing Joints in Concrete Structures”
- ICRI Technical Guideline No. 03732, “Selecting and Specifying Concrete Surface Preparation for Sealers, Coatings and Polymer Overlays.”
- ICRI Slab Moisture Testing Technician Certification.

1.03 SUBMITTALS

- A. Product Data: Submit manufacturer’s data and application instructions for specified materials.
- B. Independent Test Data: Submit accredited laboratory independent test data showing a permeance of less than .10 perms when tested in accordance with ASTM E96-05. Project application/spread rates must meet or exceed mil thickness indicated on test report.

1.04 QUALITY ASSURANCE

- A. All moisture testing shall be conducted by a Certified ICRI Slab Moisture Testing Technician, Grade 1 in good standing. Proof of credentials shall be provided on request with project submittals.
- B. Contractor shall have experience and proficiency specific to the application type and shall be approved by the architect/engineer and the material supplier.
- C. Manufacturer shall provide job service as required to assure proper handling and installation of materials. The field representative shall instruct as needed to assure that handling, mixing, placing and finishing of materials are in accordance with specifications.
- D. Pre-Installation Conference:
 - 1. Arrange a meeting not less than 30 days before starting work.
 - 2. Attendance: GC, A/E, Manufacturer's Representative/Distributor and Applicator’s representative
- D. Provide all components of the system from the same manufacturer.
- E. Provide letter of compatibility from the manufacturer for all products used to comprise the moisture control system.

SECTION 090160 – MAINTENANCE OF FLOORING – FLOORING RESTORATION (cont.)

1.05 DELIVERY, STORAGE, AND HANDLING

- A. Deliver materials to project site in manufacturer's unopened containers with labels intact.
- B. Materials shall be stored on site under dry conditions and protected from contamination.

1.06 PROJECT CONDITIONS

- A. Maintain environmental conditions (temperature, humidity, and ventilation) within limits recommended by manufacturer for optimum results. Do not install products under environmental conditions outside the manufacturer's absolute limits.
- B. Unusual conditions as uncovered during the course of work shall be brought to the architect/engineer's attention for analysis and disposition. These conditions include but are not limited to poor quality base concrete, severely corroded reinforcing steel, random cracks and surface contamination.

1.07 WARRANTY

- A. Deliver to architect signed copies of the following written warranties against defective materials and workmanship.
 - 1. Manufacturer's standard warranty covering materials.
 - 2. Applicator's standard warranty covering workmanship.

PART 2 PRODUCTS

2.01 MANUFACTURER

- A. Acceptable Manufacturer: Mapei Corporation, 1144 E. Newport Center Road, Deerfield Beach, Florida 33442 The following materials as manufactured by Mapei Corporation are considered to meet the requirements of this specification and shall be used as the basis for the selection of materials for each application type. No submittals for substitutions will be accepted after the bid date. All submittals for substitution must be made in writing to the engineer with supporting technical data sheets and test data showing complete equivalent performance.

Manufacturer Contact: Darin Weisemiller | Phone: (813) 376-3235 | email: DWeisemiller@mapei.com

2.02 MATERIALS

- A. Moisture Reduction Barrier for concrete substrates: Suitable moisture reduction barrier to treat substrate moisture levels that exceed the manufacturer's of subsequent flooring recommendations.
 - 1. Acceptable Product: **MAPEI Planiseal MVR** – Distributed exclusively by Specified Surfaces
Distributor Contact: James Longo | Phone: (386) 547-6943 | email: jlongo@specifiedsurfaces.com
A two-component, 100 percent solids epoxy, one-coat moisture barrier for concrete slabs.
 - 2. Prior to installation the following tests are to be performed:
 - a. ASTM F 2170-02, Determining Relative Humidity in Concrete Floor Slabs Using *In-situ* Probes
 - b. ASTM F 710-08, Preparing Concrete Floors to Receive Resilient Flooring

SECTION 090160 – MAINTENANCE OF FLOORING – FLOORING RESTORATION (cont.)

PART 3 EXECUTION

3.01 SUBSTRATE CONDITIONS

- A. Do not begin installation until substrates have been properly prepared. If substrate preparation is the responsibility of another installer, notify Architect of unsatisfactory preparation before proceeding.

3.02 PREPARATION

- A. All substrates must be structurally sound, surface dry and stable.
- B. Mechanically prepare the surface to obtain a CSP #3 by shotblasting per ICRI Technical Guideline 310.2-1997, Selecting and Specifying Concrete Surface Preparation for Sealers, Coatings and Polymer Overlays.
- C. Some substrates may require waiting 16 to 24 hours after shot blasting before applying Planiseal MVR to reduce out-gassing from the substrate.
- D. Acid-etching is not an acceptable means of surface prep and should not be used prior to the installation of Planiseal MVR.

3.03 JOINTS

- A. Existing expansion joints shall be maintained by forming at joint locations. Saw cut joints if filled shall be maintained and coated over with epoxy material. Unfilled saw cut joints may be filled using the Planiseal MVR epoxy resin or other suitable epoxy approved by Mapei Corporation.

3.04 CRACK REPAIR

- A. Repair cracks before application as per manufacturer's recommendations.

3.05 MIXING

- A. Mix all materials in accordance with manufacturer's printed instructions.

3.06 INSTALLATION

- A. Pour mixed Planiseal MVR onto the surface of the properly prepared substrate within 5 minutes of mixing.
- B. Spread the Planiseal MVR mixture using a notched squeegee, and back roll with a 3/8" nap roller. Apply material in accordance with product data and project approved application rate; (minimum thickness shall be 10 mils WFT). Roll material in north/south and then east/west directions across the entire surface being treated, up to and around the perimeter of any restrained surfaces.
- C. Due to the porosity of various substrates a second coat may be required. If any doubt remains about the 100% sealing of small voids from out gassing, apply a very tight or thin coat of Planiseal MVR.

3.07 CLEANING

- A. Clean equipment before Planiseal cures to a hardened state using an approved solvent or cleaning material. Cured material can only be removed mechanically.
- B. Dispose of all materials in accordance with local, state and federal regulations.

END OF SECTION 090160

SECTION 092900 - GYPSUM DRYWALL

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

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

1.02 FIRE-RESISTANCE RATINGS: Provide gypsum drywall construction fire-resistance ratings indicated, conforming to assemblies tested per ASTM E 119 by inspecting and testing organization acceptable to authorities having jurisdiction.

- A. **All fire and/or smoke barriers or walls shall be effectively and permanently identified with stenciling above any decorative ceiling and/or in concealed space with letters a minimum of three (3) inches high on a contrasting background spaced a maximum of fifteen (15) feet on center with a minimum of one per wall or barrier. The hourly fire rating shall be included on all rated barriers or walls. Wording shall be as follows: "() Hour Fire and Smoke Barrier-Protect All Openings."**
- B. **Storage rooms which are sprinklered shall have permanently stenciled, eighteen (18) inches below sprinkler heads, a designation line (red) with the following wording: "NO STORAGE ABOVE LINE." Requirements for stenciling shall be as noted above.**

PART 2 - PRODUCTS

2.01 MANUFACTURERS: Subject to compliance with requirements, provide gypsum board and related products by one of the following:

Georgia-Pacific Gypsum LLC
Lafarge North America Inc.
National Gypsum Company
USG Corporation.

2.02 STEEL FRAMING COMPONENTS FOR SUSPENDED CEILINGS: As follows, sized per ASTM C 754, unless otherwise indicated:

- A. Wire for Hangers and Ties: ASTM A 641, soft, Class 1 zinc coating.
- B. Grid Suspension System: ASTM C 645, manufacturer's standard grid suspension system composed of main beams and cross furring members which interlock to form a modular supporting network.

2.03 STEEL FRAMING FOR WALLS AND PARTITIONS: Comply with ASTM C 754 and the following:

- A. Steel Studs and Runners: ASTM C 645, 0.0312 inch (20 gauge) base metal thickness at 1- inches on center, unless otherwise indicated.
1. Height for which 0.0312 inch (20 gauge) is insufficient per manufacturer's "Limiting Height Tables", shall be accomplished in the gauge of material required by these tables. Such materials to be provided at no additional cost to the Owner.
 2. All door frame openings shall be reinforced with two (2) 0.0312 inch (20 gauge) studs on each side for a total of four (4) studs.
- B. Base Track: ASTM C 645, 0.0312 inch (20 gauge) for interior; 0.0538 inch (16 gauge) for exterior.

SECTION 092900 - GYPSUM DRYWALL (continued):

- C. Top Track: Slip Track, 0.0312 inch (20 gauge) for interior; 0.0538 inch (16 gauge) for exterior.
- D. Steel Rigid Furring Channels: ASTM C 645, 0.0179 inch (25 gauge) base metal thickness, hat-shaped.

Note: Brace top of walls to the existing trusses.

- 2.04 SECURITY MESH: Provide maximum security AMICO security mesh (ASM .50-13F) behind drywall in areas noted on drawings as "security drywall". Mesh shall be stainless steel, Grade 304, Type II, Class 3, complying with ASTM A240 and ASTM F1267. Mesh shall be manufactured by Alabama Metal Industries Corporation, Birmingham, AL OR approved equal. AMICO Secura Clips shall be used to attach security mesh to steel framing members as required by manufacturer.
- 2.05 GYPSUM BOARD: Provide gypsum board of types indicated in maximum lengths available to minimize end joints:
 - A. Exposed Gypsum Board: ASTM C 36, 5/8" thickness, Type 'X'. For fire-rated-assemblies refer to Drawings for UL Design Numbers.
 - 1. Finish / Pattern: Provide "Sheetrock Wall & Ceiling Texture (Tuf-Tex)" OR approved equal; for textured finish. Pattern shall be "spatter / knockdown" as indicated on Finish Schedule. Substrate shall be primed with flat latex wall paint (See Section 09900). Apply texture as recommended by manufacturer.
 - B. Moisture & Mold Resistant Gypsum Board: ASTM C 1396, 5/8" thickness, regular type except where Type X Fire-resistant type is indicated or required to meet UL assembly types. Edges shall be tapered. Provide Sheetrock brand Mold Tough Firecode Gypsum Panels by USG OR approved equal. **Note: All wet areas to receive Moisture & Mold Resistant Gypsum Board. Wet areas include walls and ceilings where gypsum board is specified. Areas include, but are not necessarily limited to, bathrooms, gang toilets, showers, janitor closets, kitchens and laundry areas.**
 - C. Gypsum Wallboard Sheathing: ASTM C79, 5/8" thickness, regular edges. Treated gypsum core shall be encased with specially treated water repellent paper on both sides and long edges. Application requires a 15# asphalt impregnated felt paper in cavity between gypsum sheathing and brick veneer.
 - D. Mineral Board: Provide 1/2" gypsum sheathing board core in accordance with ASTM C 1177 with glass mats both sides and long edges. Application requires a No.15, nonperforated, asphalt saturated felt complying with ASTM D 226, Type 1or equal. Provide Dens-Glass Gold by Georgia-Pacific Corp. OR approved equal.
- 2.06 TRIM ACCESSORIES: ASTM C 840; manufacturer's standard trim accessories, including cornerbead and edge trim of beaded type with face flanges for concealment in joint compound.
- 2.07 GYPSUM BOARD JOINT TREATMENT MATERIALS: ASTM C 475 and ASTM C 840, and as follows:
 - A. Joint Tape: Paper reinforcing tape, unless open-weave glass fiber tape is recommended by gypsum board manufacturer.
 - B. Setting-Type Joint Compound: Factory-prepackaged, job-mixed chemical-hardening powder products formulated for uses indicated.
 - C. Drying-Type Joint Compounds: Factory-prepackaged -premixed vinyl-based products. Taping compound formulated for embedding tape and first coat over fasteners and flanges of corner beads

SECTION 092900 - GYPSUM DRYWALL (continued):

and edge trim. Topping compound formulated for fill (2nd) and finish (3rd) coats.

2.08 MISCELLANEOUS MATERIALS: As recommended by gypsum board manufacturer:

- A. Gypsum Board Screws: ASTM C 1002.
- B. Concealed Acoustical Sealant: Comply with requirements specified in Division-7 Section "Joint Sealers."

PART 3 - EXECUTION:

3.01 INSTALL STEEL FRAMING to comply with ASTM C 754 and ASTM C 840.

- A. Do not bridge building expansion joints with support systems, frame both sides of joints with furring and other supports as indicated.
- B. Secure hangers to structural support by connecting directly to structure where possible, otherwise connect to inserts, clips other anchorage devices or fasteners as indicated.
- C. Install direct-hung grid suspension system, including perimeter wall track or angle, with members spaced and installed to comply with mfr's instructions.
- D. Install steel studs with bottom and top runner tracks anchored to substrates. Isolate system from building structure to prevent transfer of loading and deflections into metal support system, both vertically and horizontally.
- E. Install supplementary framing, runners, furring, blocking and bracing at openings and terminations in gypsum drywall and where required for support of other work which cannot be adequately supported on gypsum board alone.

3.02 INSTALL AND FINISH GYPSUM BOARD to comply with ASTM C 840 and as follows:

- A. Isolate drywall construction from abutting structural and masonry work; provide edge trim and acoustical sealant as recommended by manufacturer.
- B. Screw gypsum board to metal supports.
- C. Do not bridge building expansion joints. Leave space of the width indicated between boards, and trim both edges for installation of sealant or gasket.

3.03 INSTALL WATER-RESISTANT BACKING BOARD where indicated to receive thin-set tile.

3.04 DRYWALL FINISHING:

- A. General: Treat gypsum board joints, interior angles, edge trim, control joints, penetrations, fastener heads, surface defects, and elsewhere as required to prepare gypsum board surfaces for decoration. Promptly remove residual joint compound from adjacent surfaces.
- B. Prefill open joints and damaged surface areas.
- C. Apply joint tape over gypsum board joints, except for trim products specifically indicated as not intended to receive tape.

SECTION 092900 - GYPSUM DRYWALL (continued):

- D. Gypsum Board Finish Levels: Finish panels to levels indicated below and according to ASTM C840:

1. Level 4: (For all surfaces unless otherwise noted)

- a. All Joints and interior angles shall have tape embedded in joint compound and two separate coats of joint compound applied over all flat joints and one separate coat of joint compound applied over interior angles. Fastener heads and accessories shall be covered with three separate coats of joint compound. All joint compound shall be smooth and free of tool marks and ridges. Note: It is recommended that the prepared surface be coated with a drywall primer prior to the application of final finishes. (See Section 099000 – Painting.)

This level should be specified where flat paints, light textures, or wallcoverings are to be applied.

In critical lighting areas, flat paints applied over light textures tend to reduce joint photographing. Gloss, semi-gloss, and enamel paints are not recommended over this level of finish.

The weight, texture, and sheen level of wallcoverings applied over this level of finish should be carefully evaluated. Joints and fasteners must be adequately concealed if the wallcovering material is lightweight, contain limited pattern, has a gloss finish, or any combination of these finishes is present. Unbacked vinyl wallcoverings are not recommended over this level of finish.

2. Level 5:

- a. All Joints and interior angles shall have tape embedded in joint compound and two separate coats of joint compound applied over all flat joints and one separate coat of joint compound applied over interior angles. Fastener heads and accessories shall be covered with three separate coats of joint compound. A thin skim coat of joint compound or a material manufactured especially for this purpose shall be applied to the entire surface. The surface shall be smooth and free of tool marks and ridges. Note: It is recommended that the prepared surface be coated with a drywall primer prior to the application of finish paint. (See Section 099000 – Painting.)

This level of finish is highly recommended where gloss, semi-gloss, enamel, or nontextured flat paints are specified or where severe lighting conditions occur.

This highest quality finish is the most effective method to provide a uniform surface and minimize the possibility of joint photographing and of fasteners showing through the final decoration.

- 3.05 Install compound in 3 coats (plus prefill of cracks where recommended by manufacturer); sand between coats and after last coat.

- A. Embedding and First Coat: Ready-mix drying type all-purpose of taping compound.
B. Fill (Second) Coat: Ready-mix drying type all-purpose or topping compound.
C. Finish (Third) Coat: Ready-mix drying-type all-purpose or topping compound.

END OF SECTION 092900

SECTION 093000 – TILE

PART 1 – GENERAL

1.01 SECTION INCLUDES

- A. Tile setting mortars and adhesives.
- B. Grout for tile installation.
- C. Waterproofing membrane for tile.

1.02 REFERENCES

- A. ANSI A108 Series/A118 Series – American National Standards for Installation of Ceramic Tile.
- B. ANSI A136.1 – American National Standards for Organic Adhesives for Installation of Ceramic Tile.
- C. ASTM C 144 – Standard Specification for Aggregate for Masonry Mortar.
- D. ASTM C 150 – Standard Specification for Portland Cement.
- E. TCNA (HB) – Handbook for Ceramic Tile Installation; Tile Council of North America, Inc.
- F. ISO 13007 – International Standards Organization; classification for Grout and Adhesives.

1.03 SUBMITTALS

- A. Submit under provisions of Section 013300.
- B. Manufacturer's technical information for each product specified.
- C. Samples:
 - 1. Color charts for selection of grout.
 - 2. Two 6" x 6" samples of each porcelain tile specified.
 - 3. Two 3" x 6" samples of each ceramic wall tile specified.
- D. Installation Instructions: Manufacturer's printed instructions for each product.

1.04 DELIVERY, STORAGE AND HANDLING

- A. Deliver and store packaged materials in original containers with seals unbroken and labels intact until time of use. Prevent damage or contamination to materials by water, freezing, foreign matter or other causes.
- B. Do not use frozen materials unless specifically allowed by manufacturer.
- C. Deliver and store materials on site at least 24 hours before work begins.
- D. Provide heated and dry storage facilities on site.

SECTION 093000 - TILE (continued):

1.05 EXTRA MATERIALS

- A. Provide additional stock to Owner equaling 2% of each type and color installed.

1.06 PROJECT CONDITIONS

- A. Maintain environmental conditions and protect work during and after installation to comply with referenced standards and manufacturer's printed recommendations.
- B. Vent temporary heaters to exterior to prevent damage to tilework from carbon dioxide build-up.
- C. Maintain temperatures at no less than 50 deg F (10 deg C) in tiled areas during installation and for 7 days after completion, unless higher temperatures are required by referenced installation standards or manufacturer's written instructions.

PART 2 PRODUCTS

2.01 MANUFACTURERS

- A. Acceptable Manufacturers for grout, mortar and setting materials:
MAPEI Corp. U. S. A.,
1144 E. Newport Center Rd
Deerfield Beach, FL 33442; Toll Free Tel: 800-42-MAPEI; Tel: (954) 246 – 8888;
Fax: (954) 246 – 8801; Web: www.mapei.com
OR approved equal.
- B. Provide tile grout, setting materials, additives, waterproofing, shower-pan mortar, and factory-prepared mortars from the same manufacturer.
- C. Request for substitutions will be considered in accordance with provisions of Section 016000.

2.02 MORTAR /MATERIALS

- A. Floor Tile:
1. Thinset Bed Mortar: Premium Grade, Single-component, Ultra high performance, polymer-modified thin set mortar complying with ANSI A118.4 and ANSI A118.11; MAPEI Ultraflex 3.
 2. Grout: Solvent-free, 100%-solids epoxy grout. Non-sagging, chemical resistant grout, with high-compressive strength; MAPEI Kerapoxy 410 meeting or exceeding ANSI A118.3.

2.03 MIXES

- A. Proportion and mix materials in accordance with manufacturer's most current written instructions and applicable ANSI standards.

2.04 Porcelain Tile (PT):

Manufacturer: Trinity Tile OR approved equal.
Style: Aragonite
Color: See Color Legend in drawings.
Size: 12" x 12" x 5/16" (PT 1 & 3); 12" x 24" x 5/16" (PT-2)
Type: Porcelain, unpolished, color body
Face: Plain with coefficient of friction equal to 0.60 wet or higher as per ASTM C 1028.

SECTION 093000 - TILE (continued):

Dynamic coefficient of friction equal to 0.42 wet or higher as per Acu/Test.
Contact: Robin Ritchey, Trinity Tile, 850.210.2643

- 2.05 Metal Transition Strip: Provide a metal transition strip between porcelain tile and carpet equal to Schluter RENO-TK and between porcelain tile and resilient tile equal to Schluter RENO-U in a satin anodized aluminum finish. Trim RENO-U shall be installed with resilient tile abutting the 4 mm (5/32") front edge. Do not run resilient tile under this trim.
- 2.06 Setting Materials: Provide setting materials as follows:
- A. Sealer: ASTM E 96 Tile/grout sealer shall be water based, sub-surface, water repellent equal to Silox 110 by Cerama Seal, where applicable.
 - B. Waterproofing and crack-isolation membrane (floors): Trowel applied, flexible, fiber-mesh-reinforced waterproofing and crack-isolation membrane applied as per ANSI A118.10; Mapei, Mapelastic 315. Install membrane to comply with pertinent codes and manufacturer's directions.
 - I. Fiberglass Mesh: Use Mapei Fiberglass mesh with Mapelastic 315.

PART 3 – EXECUTION

3.01 EXAMINATION AND SURFACE PREPARATION

- A. Before work commences, the flooring contractor must examine areas to be covered and report any deficiency or adverse condition in writing to the general contractor and architect.
- B. Do not proceed with the work until surfaces and conditions comply with the requirements indicated in the manufacturer's instructions, applicable industry standard, federal, state, provincial, local regulations and good work practices. By beginning work, the applicator/user acknowledges that the conditions are acceptable for installation.
- C. All concrete substrates must be fully cured and free of any hydrostatic and/or moisture problems. The moisture-vapor emission from a concrete slab must not exceed the industry accepted level per 1,000 sq. ft. (1,36 kg per 92,9m²) per 24 hours as measured by the anhydrous calcium chloride test kit, based upon test method ASTM F1869. It also must not exceed the flooring or adhesive manufacturer's written limitations for suitable emission rates.
- D. Substrates should be sound, stable and free of all oils, grease, loose debris, paint, drywall debris, curing agents, sealers or any potential bond breaking contaminants must be removed mechanically. Do not use chemicals for surface prep. Consult the manufacture for their specific recommendations.
- E. Do not install over vinyl asbestos tile (VAT) or any flooring, substrate or substance that may contain asbestos. Do not install over any adhesives, including asphalt cutback residue, that may have been used to install flooring containing asbestos. Do not sand or remove any existing resilient floors or cutback adhesive that contains asbestos fibers or crystalline silica. For removal instructions, refer to the Resilient Floor Covering Institute's Recommended Work Practices. Follow all local, state and federal regulations and industry standards when mechanical removal is required.
- F. All substrates must be plumb and flat to a tolerance in plane of 1/4" in 10' for floors and 1/4" in 8' for walls. Refer to manufactures specifications for their specific product.

SECTION 093000 - TILE (continued):

3.02 INSTALLATION

- A. Comply with ANSI A108.1 and 108.4 through A108.10, as applicable for type of tile; setting materials, and grout. Comply with manufacturer's instructions for application of proprietary materials.
- B. Comply with standards by the TCNA, Tile Council of North America.
- C. Install expansion and control joints in accordance with TCNA EJ-171 – 14.
- D. Joint Pattern: As required by manufacturer
- E. Slab on grade floor tile installed according to TCNA F115- 14.
- F. Wall tile installed according to TCNA W244C-14.

3.03 PROTECTION

- A. Floors: Protect from all traffic for at least 72 hours after installation.
 - 1. Do not step on floor for at least 24 hours; if traffic is unavoidable after that, use plywood stepping boards.
 - 2. Protect from heavy traffic for at least 7 days after installation.
 - 3. Protect from food products and chemicals which can cause staining for at least 14 days.
 - 4. Protect from freezing and total water immersion for at least 21 days after installation.
- B. Walls: Protect from impact, vibration and heavy hammering on adjacent and opposite walls for at least 14 days after installation, unless manufacturer's instructions allow a shorter period.

- 3.04 Cleaning and Protection: Clean tile in accordance with applicable ANSI standard for type of tile and method of installation used and manufacturer's instructions. Apply heavy craft paper or other heavy protective covering to prevent surface damage.

END OF SECTION 093000

SECTION 095123 - ACOUSTICAL CEILINGS

PART 1 - GENERAL

- 1.01 Acoustical Panel and Tile Standard: FS SS-S-118.
- 1.02 Acoustical Suspension System Standards: ASTM C 635 for materials, ASTM C 636 for installation.
- 1.03 Surface Burning Characteristics: 25 or less for flame spread, 50 or less for smoke developed, per ASTM E 84.
- 1.04 Submittals: Submit product data for each type of acoustical ceiling unit and suspension system required, along with 6" square samples of each type of acoustical unit and 12" long samples of exposed runners and moldings.
- 1.05 Deliver extra materials to Owner. Furnish extra materials of each size and type matching products installed and equaling 2.0% of acoustical units and exposed suspension members installed. Package materials in protective covering and identify with appropriate labels.

PART 2 - PRODUCTS:

- 2.01 ACT - Mineral Composition Panels - Wet-formed mineral fiber with factory applied latex paint finish; Type III; Form 2; Class A and as follows:
- Color/Light Reflectance: White/LR (85% and over.)
- Grade: NRC .70
- CAC: 35.
- Edge Detail: Square.
- Size: 24" x 24" x 3/4".
- Products: Subject to compliance with requirements, provide "Fine Fissured-High NRC" #1713 by Armstrong World Industries, Inc. OR approved equal.
- 2.02 Dimensional Stability: Ceilings shall have performance equal to Armstrong's "HumiGuard Plus" OR USG's "ClimaPlus". The surface and back of the product shall be treated with Armstrong's "BioBlock", a paint that contains a special biocide that inhibits or retards the growth of mold or mildew, or intercept anti-microbial paint. Ceilings shall have a thirty (30) year warranty against sagging or warping when installed according to manufacturer's recommendations.
- 2.03 Non-Fire-Resistance-Rated Exposed Double Web Steel Direct-Hung Suspension System with 15/16" Wide Exposed Faces: Roll-formed from prefinished cold-rolled steel sheet, with hanger wire, attachment devices and edge moldings and trim; intermediate-duty system structural classification; white painted finish. Note: All cold-rolled steel sheets shall be hot dipped galvanized (G-30).
- Armstrong – 15/16" Prelude XL.
(Manufacturer's Ceiling Tile shall be installed with Manufacturer's Suspension System in order to keep the 30 year system warranty. No alternate manufacturers warranties will be accepted).

SECTION 095123 - ACOUSTICAL CEILINGS (continued):

PART 3 - EXECUTION

- 3.01 Layout: Balance ceiling borders on opposite sides, using more-than-half-width acoustical units.
- 3.02 Tolerance: 1/8" in 12'-0" level tolerance.
- 3.03 Suspension System: Secure to building structure, with hangers spaced 4'-0" along supported members.
- 3.04 Edge Moldings: Secure to substrate with screw anchors spaced 16" o.c. Miter corner joints. Cope exposed edges of intersecting exposed suspension members to produce flush intersections.
- 3.05 Sprinkler heads to be centered in ceiling tiles unless otherwise noted and approved.

END OF SECTION 095123

SECTION 096500 – RESILIENT TILE

PART 1 – GENERAL

1.01 RELATED DOCUMENTS:

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

1.02 SUMMARY:

- A. Section Includes:
 - 1. Resilient floor tile.

1.03 SUBMITTALS:

- A. Product Data: For each type of product indicated.
- B. Samples for Verification: Full-size units of each color and pattern of floor tile required.
- C. Qualification Data: For qualified Installer.
- D. Maintenance Data: For each type of floor tile to include in maintenance manuals.

1.04 QUALITY ASSURANCE

- A. Qualifications: A qualified installer who employs workers for this Project who are competent in techniques required by manufacturer for floor tile installation indicated.
 - 1. Engage an installer who employs workers for this Project who are trained for installation techniques required.
- B. Fire-Test-Response Characteristics: As determined by testing identical products according to ASTM E 648 or NFPA 253 by a qualified testing agency.
 - 1. Critical Radiant Flux Classification: Class I, not less than 0.45 W/sq. cm.

1.05 DELIVERY, STORAGE, AND HANDLING

- A. Store floor tile and installation materials in dry spaces protected from the weather, with ambient temperatures maintained within range recommended by manufacturer, but not less than 50 deg F (10 deg C) or more than 90 deg F (32 deg C). Store floor tiles on flat surfaces.

1.06 PROJECT CONDITIONS

- A. Maintain ambient temperatures within range recommended by manufacturer, but not less than 68 deg F (20 deg C) or more than 72 deg F (22.2 deg C), in spaces to receive floor tile during the following time periods:
 - 1. 48 hours before installation.
 - 2. During installation.
 - 3. 48 hours after installation.
- B. Until Substantial Completion, maintain ambient temperatures within range recommended by manufacturer, but not less than 60 deg F (15.6 deg C or more than 80 deg F (26.7 deg C).
- C. Close spaces to traffic during floor tile installation.
- D. Close spaces to traffic for 48 hours after floor tile installation.
- E. Install floor tile after other finishing operations, including painting, have been completed.

SECTION 096500 – RESILIENT TILE (continued):

1.08 EXTRA MATERIALS

- A. Furnish extra materials that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.
 - 1. Floor Tile: Furnish 1 box for every 50 boxes or fraction thereof, of each type, color, and pattern of floor tile installed.

PART 2 - PRODUCTS

2.01 RESILIENT TILE - RT

- A. Mfr: Centiva OR approved equal
Series: Contour
Contact: Emi Chavez-Miller with Commercial flooring (904) 327-9858
- B. Tile Standard: ASTM F 1700.
 - 1. Class: Class III, printed film resilient tile.
 - 2. Type: Type B, embossed surface.
- C. Nominal Thickness: overall - 0.120 inch (3.0 mm); wear layer - 0.032 inch (0.81 mm)
- D. Test Performance:
ASTM E648: Critical Radiant Flux - Class 1, CRF > 0.45
ASTM E662: Smoke Density - > 450, Good
ASTM F925: Chemical Resistance - Excellent
ASTM C1028: Slip resistance - Very good
ASTM D2047: Passes
ADA Compliant: FTC slip resistant classified product
- E. Size: See Color Legend in drawings
- F. Seaming Method: Standard
- G. Edges: Square
- H. Surface Texture: See Color Legend in drawings
- I. Color: See color legend in drawings.
- J. Warranty: 20 year commercial

2.02 INSTALLATION MATERIALS

- A. Trowelable Leveling and Patching Compounds: Latex-modified, portland cement based formulation provided or approved by manufacturer for applications indicated.
 - 1. Basis-of-Design Product: Subject to compliance with requirements, provide Centiva; 6000 for 6 lbs. of mver. Provide mr 12 adhesive if mver is between 6 lbs and 12 lbs.

PART 3 - EXECUTION

3.01 EXAMINATION

- A. Examine substrates, with Installer present, for compliance with requirements for maximum moisture content

SECTION 096500 – RESILIENT TILE (continued):

and other conditions affecting performance of the Work.

- B. Verify that finishes of substrates comply with tolerances and other requirements specified in other Sections and that substrates are free of cracks, ridges, depressions, scale, and foreign deposits that might interfere with adhesion of floor tile.
- C. Proceed with installation only after unsatisfactory conditions have been corrected.

3.02 PREPARATION

- A. Prepare substrates according to manufacturer's written instructions to ensure adhesion of resilient products.
- B. **Concrete Substrates:** Prepare according to ASTM F 710.
 - 1. Verify that substrates are dry and free of curing compounds, sealers, and hardeners.
 - 2. Remove substrate coatings and other substances that are incompatible with adhesives and that contain soap, wax, oil, or silicone, using mechanical methods recommended by manufacturer. Do not use solvents.
 - 3. **Alkalinity and Adhesion Testing:** Perform tests recommended by manufacturer. Proceed with installation only after substrates pass testing.
 - 4. **Moisture Testing:** Perform tests recommended by manufacturer **and as follows**. Proceed with installation only after substrates pass testing. Testing shall be done by an independent third party.
 - a. Perform anhydrous calcium chloride test, ASTM F 1869. Proceed with installation only after substrates have maximum moisture-vapor-emission rate of 5 lb of water/1000 sq. ft. (2.27 kg of water/92.9 sq. m) in 24 hours.
 - b. Perform relative humidity test using in situ probes, ASTM F 2170. Proceed with installation only after substrates have a maximum **75%** relative humidity level measurement.
 - c. Both tests shall be done. Results shall be documented and retained. A copy shall be submitted to the Architect, Contractor and Flooring Subcontractor within 72 hours.
- C. Fill cracks, holes, and depressions in substrates with trowelable leveling and patching compound and remove bumps and ridges to produce a uniform and smooth substrate.
- D. Do not install floor tiles until they are same temperature as space where they are to be installed.
 - 1. Move resilient products and installation materials into spaces where they will be installed at least 48 hours in advance of installation.
- E. Sweep and vacuum clean substrates to be covered by resilient products immediately before installation.

3.03 FLOOR TILE INSTALLATION

- A. Comply with manufacturer's written instructions for installing floor tile.
- B. Lay out floor tiles from center marks established with principal walls, discounting minor offsets, so tiles at opposite edges of room are of equal width. Adjust as necessary to avoid using cut widths that equal less than one-half tile at perimeter.
- C. Match floor tiles for color and pattern by selecting tiles from cartons in the same sequence as manufactured and packaged, if so numbered. Discard broken, cracked, chipped, or deformed tiles.
 - 1. Lay tiles carefully, noting directional arrows on the back of tiles when present.
- D. Scribe, cut, and fit floor tiles to butt neatly and tightly to vertical surfaces and permanent fixtures including built-in furniture, cabinets, pipes, outlets, and door frames.
- E. Extend floor tiles into toe spaces, door reveals, closets, and similar openings. Extend floor tiles to center of door openings.

SECTION 096500 – RESILIENT TILE (continued):

- F. Maintain reference markers, holes, and openings that are in place or marked for future cutting by repeating on floor tiles as marked on substrates. Use chalk or other nonpermanent, nonstaining marking device.
- G. Install floor tiles on covers for telephone and electrical ducts, building expansion-joint covers, and similar items in finished floor areas. Maintain overall continuity of color and pattern between pieces of tile installed on covers and adjoining tiles. Tightly adhere tile edges to substrates that abut covers and to cover perimeters.
- H. Adhere floor tiles to flooring substrates using a full spread of adhesive applied to substrate to produce a completed installation without open cracks, voids, raising and puckering at joints, telegraphing of adhesive spreader marks, and other surface imperfections.

3.04 **CLEANING AND PROTECTION**

- A. Comply with manufacturer's written instructions for cleaning and protection of floor tile.
- B. Perform the following operations immediately after completing floor tile installation:
 - 1. Remove adhesive and other blemishes from exposed surfaces.
 - 2. Sweep and vacuum surfaces thoroughly.
 - 3. Damp-mop surfaces to remove marks and soil.
- C. Protect floor tile products from mars, marks, indentations, and other damage from construction operations and placement of equipment and fixtures during remainder of construction period.
- D. Remove soil, visible adhesive, and surface blemishes from floor tile surfaces .
 - 1. Not less than 48 hours after installation, clean floor with a neutral liquid cleaner, as recommended by the flooring and cleaner manufacturers.

END OF SECTION 096500

SECTION 096513 - RESILIENT WALL BASE

PART 1 - GENERAL

1.01 SUMMARY:

- A. Section Includes: RESILIENT WALL BASE AND PROFILED RESILIENT WALL BASE

1.02 REFERENCED DOCUMENTS:

- A. ASTM International
1. E84, Standard Test Method for Surface Burning Characteristics of Building Materials.
 2. E648, Standard Test Method for Critical Radiant Flux of Flooring Systems Using a Radiant Energy Source.
 3. E662, Test Method for Specific Density of Smoke Generated by Solid Materials.
 4. F137, Standard Test Method for Flexibility of Resilient Flooring Materials with Cylindrical Mandrel Apparatus.
 5. F925, Standard Test Method for Resistance to Chemicals of Resilient Flooring.
 6. F1861, Standard Specification for Resilient Wall Base.
- B. Other Referenced Documents
1. National Fire Protection Association (NFPA), NFPA 255; Test Method for Critical Radiant Flux of Floor Covering Systems Using a Radiant Energy Source.
 2. National Fire Protection Association (NFPA), NFPA 258; Test Method for Specific Density of Smoke Generated by Solid Materials.

1.03 SUBMITTALS:

- A. Product Data: Submit product data, including manufacturer's specification summary sheet for specified products.
- B. Shop Drawings: Submit shop drawings showing layout, finish colors, patterns and textures.
- C. Samples: Submit selection and verification samples for finishes, colors, and textures.
- D. Quality Assurance Submittals: Submit the following
1. Test Reports: Certified test reports showing compliance with specified performance characteristics and physical properties.
 2. Manufacturer's Instructions: Manufacturer's installation and maintenance instructions.
- E. Maintenance Information: Maintenance information for installed products in accordance with Division 1 sections.
1. Methods for maintaining installed products.
 2. Precautions against cleaning materials and methods detrimental to finishes and performance.
- F. Warranty: Warranty documents specified herein.

1.04 QUALITY ASSURANCE:

- A. Installer Qualifications: Installer experienced in performing work of this section who has specialized in installing work similar to that required for this project.
- B. Regulatory Requirements
1. Fire Performance characteristics: Provide resilient wall base with the following Fire performance characteristics as determined by testing products in accordance with ASTM method (and NFPA method) indicated below by a certified testing laboratory or another testing and inspecting agency acceptable to authorities having jurisdiction.

SECTION 096513 - RESILIENT WALL BASE (continued):

- a. ASTM E648 (NFPA 253), Critical Radiant Flux of Floor Covering Systems; Class 1, Greater than 0.45 W/cm².
- b. ASTM E662 (NFPA 258), Specific Optical Density of Smoke Generated by Solid Materials; < 450.

- C. Single-Source Responsibility: Obtain resilient wall base tile and manufacturer's recommended adhesive from a single supplier.
- D. Pre-Installation Meetings: Conduct pre-installation meeting to verify project requirements, Manufacturer's conditions, recommended adhesive depending on product, substrate type and type of installation, manufacturer's installation instructions and manufacturer's warranty requirements. Comply with requirements in Division 1.

1.05 DELIVERY, STORAGE AND HANDLING:

- A. General: Comply with requirements in Division 1.
- B. Ordering: Comply with manufacturer's ordering instructions and lead-time requirements to avoid construction delays.
- C. Delivery: Deliver materials in manufacturer's original, unopened, undamaged containers with Identification labels intact.
- D. Storage and Protection: Store materials protected from exposure to harmful weather conditions and acclimated to site conditions at temperature and humidity conditions recommended by manufacturer.

1.06 PROJECT CONDITIONS:

- A. Environmental Requirements/Conditions: In accordance with manufacturer's recommendations, areas to receive rubber flooring shall be clean, fully enclosed, weather tight with the permanent HVAC set at a uniform temperature of 65° - 85° F for 48 hours prior to, during and thereafter installation of rubber flooring. Rubber flooring and adhesive shall be conditioned in the same manner. Rubber flooring/tile must be unboxed at least 48 hours prior to installation in the areas in which it will be installed.

1.07 SEQUENCING AND SCHEDULING:

- A. Finishing Operations: Install resilient wall base after finishing operations, including floor covering, painting and ceiling operations, have been completed.

1.08 MAINTENANCE:

- A. Extra Materials: Deliver to Owner extra materials from same production run as products installed. Package products with protective covering and identify with descriptive labels. Comply with Division 1, Closeout Submittals Section.
- B. Quantity: Furnish quantity of resilient wall base equal to 5% of amount to be installed.
- C. Delivery, Storage and Protection: Comply with Owner's requirements for delivery, storage and protection of extra materials.
- D. Maintenance of finished resilient wall base to be conducted per Manufacturer's Maintenance Guide.

SECTION 096513 - RESILIENT WALL BASE (continued):

1.09 WARRANTY:

- A. Manufacturer's Materials Warranty: Submit, for Owner's acceptance, manufacturer's standard warranty document. Manufacturer's warranty is in addition to, and not a limitation of, other rights Owner may have under Contract Documents.
 - 1. Warranty: 1 year limited warranty commencing on Date of Substantial Completion. Notice of any defect must be made in writing to manufacturer within 30 days after buyer learns of the defect.

PART 2 - PRODUCTS

2.01 RESILIENT WALL BASE

- A. Manufacturer: Flexco Corporation, 1401 E. 6th Street, Tuscumbia, AL 35674. Phone: 800-633-3151, Fax: 800-346-9075, Web: www.flexcofloors.com OR approved equal.
- B. Test results
 - 1. ASTM D570, Water Absorption of Plastics; < 0.15%.
 - 2. ASTM E84 (NFPA 255), Surface Building Characteristics of Building Materials; Class C.
 - 3. ASTM E648 (NFPA 253), Critical Radiant Flux; Class 1, > 1.0 W/cm².
 - 4. ASTM E662 (NFPA 258), Specific Optical Density of Smoke Generated by Solid Materials; Passes.
 - 5. ASTM F925, Resistance to Chemicals; Passes, List Available.
 - 6. ASTM F1515, Light Stability; Excellent.
 - 7. ASTM F1861, Standard Specification for Resilient Wall Base - Types TS, TP & TV, Group 1 & 2, Styles A&B; (Federal Specification SSW40a, Type II, Styles A&B).
 - 8. NFPA 101 Life Safety Code, Wall Base; Interior floor trim material used at the junction of the wall and the floor to provide a functional or decorative border, and not exceeding 6 in. (150 mm) in height shall meet the requirements for the interior wall finish for its location or the requirements for Class II interior floor finish as described (CFR > .22 W/cm² / < .45 W/cm²) using ASTM E 648. If Class I floor finish is required (CFR > .45 W/cm²), the interior floor trim shall be Class I.
- C. Products:
 - 1. **Resilient Base - RB:** BASE 2000 Wall Base.
 - a. Color: See Color Legend in drawings.
 - b. Complies with ASTM F 1861 Type TP (Thermoplastic Rubber), Group 2 (Layered).
 - c. Profile:
 - 1) Standard Toe (Cove base)
 - d. Height:
 - 1) 4" (101.6 mm)
 - e. Length:
 - 1) 120' (36.57 m) Coils (4 foot pieces are not acceptable)
 - f. Thickness: 1/8" (3.175 mm)
 - g. Corner Installation:
 - 1) Preformed.

PART 3 - EXECUTION

3.01 MANUFACTURER'S INSTRUCTIONS:

- A. Compliance: Comply with manufacturer's requirements as published in Flexco installation instructions.
- B. Adhesive: Flexco 106 Wall Base Adhesive.
- C. Caulking: Flexco colored caulking as required.

SECTION 096513 - RESILIENT WALL BASE (continued):

3.02 EXAMINATION:

- A. Site Verification of Conditions: Confirm substrate conditions (which have been previously addressed under other sections) are acceptable for product installing in accordance with manufacturer's instructions.
- B. Material Inspection: In accordance with manufacturer's installing requirements, visually inspect materials prior to installing. Material with visual defects shall not be installed.

3.03 PREPARATION:

- A. Adjacent Surfaces Protection: Protect adjacent work areas and finish surfaces from damage while installing.
- B. Substrate Preparation: Prepare substrate to be smooth, rigid, flat, level, permanently dry, clean and free of foreign materials such as paint, dust, grease, oils, solvent, old adhesive residue, vinyl wall coverings, non-porous surfaces and all other contaminants that may interfere with adhesive bond.
- C. Do not install over existing floor covering or over substrates not approved by manufacturer.

3.04 INSTALLING:

- A. Refer to Flexco installation instructions for specific resilient wall base detailed specifications on installing.
 - 1. Accessories: Architect shall specify manufacturers' color coordinated accessories as required, including (but not limited to) resilient wall base, stair nosing, reducers or other edgings, welding rods for heat welded seams.

3.05 FIELD QUALITY REQUIREMENTS:

- A. Manufacturer's Field Services: Upon Owner's request and with minimum 72 hours notice, provide manufacturer's field service consisting of product use recommendations and periodic site visits to confirm installing of product is in accordance with manufacturer's instructions.
- B. Site Visits: (Two).

3.06 PROTECTION:

- A. Protection: Protect installed product and finish surfaces from damage during construction. Remove and legally dispose of protective covering at time of substantial completion.
- B. Restrict cleaning for first 72 hours.

3.07 INITIAL MAINTENANCE PROCEDURES:

- A. General: Include in contract sum cost for initial maintenance procedures and execution by professional maintenance personnel after resilient wall base has been installed for 72 hours as specified in the Flexco maintenance instructions.

3.08 CLEANING:

- A. Cleaning: See Johnsonite maintenance instructions. Remove temporary coverings and protection of adjacent work areas. Repair or replace damaged installed products. Clean installed products in accordance with manufacturer's instructions prior to owner's acceptance. Remove construction debris from project site and legally dispose of.

END OF SECTION 096513

SECTION 096700 – SPECIAL COATINGS FOR CONCRETE

PART 1 GENERAL

1.01 SECTION INCLUDES:

- A. Fluid-applied flooring for Concrete

1.02 RELATED SECTIONS:

- A. Division 3 – Concrete

1.03 REFERENCES:

- A. SSPC-SP 1 - Solvent Cleaning
- B. SSPC-SP 2 - Hand Tool Cleaning
- C. SSPC-SP 3 - Power Tool Cleaning
- D. SSPC-SP 13 / NACE No. 6 Surface Preparation for Concrete
- E. ASTM F1869 - Moisture Test by use of Calcium Chloride
- F. ASTM D4258 - Standard Practice for Cleaning Concrete
- G. ASTM D4259 - Standard Practice for Abrading Concrete
- H. ASTM D4260 - Standard Practice for Etching Concrete
- I. ASTM D4263 - Plastic Sheet Method for Checking Moisture in Concrete
- J. EPA-Method 24
- K. ICRI # 03732

1.04 SUBMITTALS:

- A. Submit under provisions of Section 013300, Submittals.
- B. Product Data: Manufacturer's data sheets on each paint and coating product should include:
 - Product characteristics
 - Surface preparation instructions and recommendations
 - Primer requirements and finish specification
 - Storage and handling requirements and recommendations
 - Application methods
 - Cautions
- C. Selection Samples: Submit a complete set of color chips that represent the full range of manufacturer's color samples available.
- D. Verification Samples: For each finish product specified, submit samples that represent actual product, color, and sheen.

1.05 MOCK-UP:

Include a mock-up if the project size and/or quality warrant taking such a precaution. The following is one example of how a mock-up on a large project might be specified. When deciding on the extent of the mock-up, consider all the major different types of painting on the project.

SECTION 096700 – SPECIAL COATINGS FOR CONCRETE (cont.):

- A. Finish surfaces for verification of products, colors, & sheens.
- B. Finish area designated by Architect.
- C. Provide samples that designate prime & finish coats.
- D. Do not proceed with remaining work until the Architect approves the mock-up samples.

1.06 DELIVERY, STORAGE, AND HANDLING:

- A. Delivery: Deliver manufacturer's unopened containers to the work site. Packaging shall bear the manufacturer's name, label, and the following list of information:
 - 1. Product name, and type (description)
 - 2. Application & use instructions
 - 3. Surface preparation
 - 4. VOC content
 - 5. Environmental issues
 - 6. Batch date
 - 7. Color number
- B. Storage: Store and dispose of solvent-based materials, and materials used with solvent-based materials, in accordance with requirements of local authorities having jurisdiction. Store materials in an area that is within the acceptable temperature range, per manufacturer's instructions. Protect from freezing.
- C. Handling: Maintain a clean, dry storage area, to prevent contamination or damage to the coatings.

1.07 PROJECT CONDITIONS:

- A. Maintain environmental conditions (temperature, humidity, and ventilation) within limits recommended by manufacturer for optimum results. Do not apply coatings under environmental conditions outside manufacturer's absolute limits.

PART 2 - PRODUCTS

2.01 MANUFACTURERS:

- A. Acceptable Manufacturer:

The Sherwin-Williams Company OR Approved Equal
101 Prospect Avenue NW
Cleveland, OH 44115
Tel: (800) 321-8194
Fax: (216) 566-1392

- B. Substitutions: Requests for substitutions will be considered in accordance with provisions of Section 016000 Product Requirements. When submitting request for substitution, provide complete product data specified above under Submittals, for each substitute product.

2.02 APPLICATION/SCOPE:

- A. See Finish Plans for locations.

SECTION 096700 – SPECIAL COATINGS FOR CONCRETE (cont.):

2.03 SCHEDULE:

- A. SPC-1: Light Industrial Duty: (Is Generally Considered For Industrial Foot Traffic & handcars)
1st Coat: ArmorSeal® Tread-Plex™, B90 Series
(1.5 - 2.0 mils dry)
2nd Coat: ArmorSeal® Tread-Plex™, B90 Series
(1.5 - 2.0 mils dry per coat)
Additive: SharkGrip for slip resistance
Spread Density Mock-up must be approved by Architect
Color: Architect to select color from manufactures standard colors plus 120 tints.
- B. SPC-2: Severe Industrial Duty: (Is Generally Considered for Heavy Vehicle Traffic, Heavy Abrasion Areas, & Frequent Cleaning/Rinsing.)
Epoxy Primer / Self-Leveling Epoxy System
1st Coat: ArmorSeal® 33 Epoxy Primer/Sealer, B58AQ33 Series
(7.0 - 8.0 mils dry)
2nd Coat: ArmorSeal® 650 SL/RC Self-Leveling Epoxy, B58Q650 Series
(10.0 - 30.0 mils dry per coat)
Additive: 46 Mesh Aluminum Oxide for slip resistance
Spread Density Mock-up must be approved by Architect
Color: Architect to select color from manufactures standard colors plus 120 tints.

2.04 MATERIALS - GENERAL REQUIREMENTS:

- A. Paints and Coatings - General:
1. Unless otherwise indicated, provide factory-mixed coatings. When required, mix coatings to correct consistency in accordance with manufacturer's instructions before application. Do not reduce, thin, or dilute coatings or add materials to coatings unless such procedure is specifically described in manufacturer's product instructions.
- B. Primers:
1. Where the manufacturer offers options on primers for a particular substrate, use primer categorized as "best" by the manufacturer.

2.05 ACCESSORIES:

- A. Coating Application Accessories:
1. Provide all primers, sealers, cleaning agents, cleaning cloths, sanding materials, and clean-up materials required, per manufacturer's specifications.

PART 3 EXECUTION

3.01 EXAMINATION:

- A. Do not begin application of coatings until substrates have been properly prepared. Notify Architect of unsatisfactory conditions before proceeding.
- B. If substrate preparation is the responsibility of another installer, notify Architect of unsatisfactory preparation before proceeding.
- C. Proceed with work only after conditions have been corrected, and approved by all parties, otherwise application of coatings will be considered as an acceptance of surface conditions.

SECTION 096700 – SPECIAL COATINGS FOR CONCRETE (cont.):

3.02 SURFACE PREPARATION:

- A. Proper product selection, surface preparation, and application affect coating performance. Coating integrity and service life will be reduced because of improperly prepared surfaces. Selection and implementation of proper surface preparation ensures coating adhesion to the substrate and prolongs the service life of the coating system.
- B. Selection of the proper method of surface preparation depends on the substrate, the environment, and the expected service life of the coating system. Economics, surface contamination, and the effect on the substrate will also influence the selection of surface preparation methods.
- C. Surface must be clean, dry, and in sound condition. Remove all oil, dust, grease, dirt, loose rust, and other foreign material to ensure adequate adhesion.
- D. New Poured Concrete
 - 1. For surface preparation, refer to SSPC-SP13/NACE 6/ICRI # 03732. Surfaces must be clean, dry, sound and offer sufficient profile to achieve adequate adhesion. Minimum substrate cure is 28 days at 75°F. Remove all form release agents, curing compounds, salts, efflorescence, laitance, and other foreign matter by sandblasting, shotblasting, or mechanical scarification. Chemical means is not accepted. Refer to ASTM D4260. Rinse thoroughly to achieve a final pH between 8.0 and 10.0. Allow to dry thoroughly prior to coating.
- E. Fill all cracks, voids, bug holes and joints with appropriate filler or ArmorSeal Crack Filler, ArmorSeal Joint Sealant, or ArmorSeal Expresspatch.
- F. Always follow the ASTM methods listed below:
 - 1. ASTM F1869 Moisture Test by use of Calcium Chloride
 - 2. ASTM F2170 Relative Humidity Moisture Test with in-situ probes.
 - 3. ASTM D4258 Standard Practice for Cleaning Concrete.
 - 4. ASTM D4259 Standard Practice for Abrading Concrete.
 - 5. ASTM D4260 Standard Practice for Etching Concrete.
 - 6. ASTM D4263 Plastic Sheet Method for Checking Moisture in Concrete.
 - 7. SSPC-SP 13/Nace 6 Surface Preparation of Concrete
 - 8. ICRI # 03732 Surface Preparation of Concrete

WARNING! Removal of old paint by sanding, scraping or other means may generate dust or fumes that contain lead. Exposure to lead dust or fumes may cause brain damage or other adverse health effects, especially in children or pregnant women. Controlling exposure to lead or other hazardous substances requires the use of proper protective equipment, such as a properly fitted respirator (NIOSH approved) and proper containment and cleanup. For more information, call the National Lead Information Center at 1-800-424-LEAD (in US) or contact your local health authority.

- G. Moisture Testing: Perform tests recommended by manufacturer **and as follows**. Proceed with installation only after substrates pass testing. Testing shall be done by an independent third party.
 - 1. Perform anhydrous calcium chloride test, ASTM F 1869. Proceed with installation only after substrates have maximum moisture-vapor-emission rate of 3 lb of water/1000 sq. ft. in 24 hours.
 - 2. Perform relative humidity test using in situ probes, ASTM F 2170. Proceed with installation only after substrates have a maximum **80%** relative humidity level measurement.
 - 3. Both test shall be done. Results shall be documented and retained. A copy shall be submitted to the Architect, Contractor and Flooring Subcontractor.

3.03 INSTALLATION:

- A. Apply all coatings and materials with manufacturer's specifications in mind. Mix and thin coatings according

SECTION 096700 – SPECIAL COATINGS FOR CONCRETE (cont.):

to manufacturer's recommendation.

- B. Do not apply to wet or damp surfaces.
 - 1. Wait at least 28 days before applying to new concrete or masonry. Or follow manufacturer's procedures to apply appropriate coatings prior to 28 days.
 - 2. Test new concrete for moisture content.
- C. Apply coatings using methods recommended by manufacturer.
- D. Uniformly apply coatings without runs, or sags, without brush marks, and with consistent sheen.
- E. Apply coatings at spreading rate required to achieve the manufacturer's recommended dry film thickness.
- F. Inspection: The coated surface must be inspected and approved by the Architect or Engineer just prior to each coat.

3.04 **PROTECTION:**

- A. Protect finished coatings from damage until completion of project.
- B. Touch-up damaged coatings after substantial completion, following manufacturer's recommendation for touch up or repair of damaged coatings. Repair any defects that will hinder the performance of the coatings.

END OF SECTION 096700

SECTION 096705 – RESINOUS FLOORING (BASE BID)

PART 1 – GENERAL

1.01 SUMMARY

A. Section Includes:

1. Fluid applied urethane cement flooring and 4” integral formed cove base.
2. Joint and termination strips if specified.
3. Locate and treat all joints and cracks as required. See submittals below.
4. Accessories necessary for complete installation.
5. General Contractor shall provide sufficient water, temporary heat and light, and adequate electric power with suitable outlets connected and distributed for use within 100 feet of any working space.
Note: Ambient temperature shall be maintained as per manufacturer recommendations, minimum 60 degrees Fahrenheit.
6. Backing for urethane cement cove base must be cement board, concrete block, or concrete.

B. Related Sections:

1. Cast-in-Place Concrete: Section 033000.
 - a. Concrete sub-floor to be level (maximum variation not to exceed ¼ inch in 10 feet) and to have a steel troweled finish. No curing agents or other additives which could prevent bonding should be used unless the mechanical surface preparation method used completely removes any curing agent residue or sealer.
 - b. Slabs on grade must have an efficient puncture resistant vapor barrier a minimum thickness of 10 mils placed directly under the slab.
2. Sealants: Section 07920.
3. Gypsum Drywall: Section 09250.
4. Adjacent floor finishes: Division 9.

1.02 REFERENCE STANDARDS

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

A. American Society for Testing and Materials (ASTM) Publications:

- C-307 Test Method for Tensile Strength of Chemical-Resistant Mortars.
- C-501 Test Method for Relative Resistance to Wear Unglazed Ceramic Tile by the Taber Abraser.
- C-531 Test Method for Linear Shrinkage and Coefficient of Thermal Expansion of Chemical-Resistant Mortars, Grouts, and Monolithic Surfacing.
- C-579 Test Methods for Compressive Strength of Chemical-Resistant Mortars and Monolithic Surfaces.
- C-580 Test Method for Flexural Strength and Modulus of Elasticity of Chemical-Resistant Mortars, Grouts, and Monolithic Surfacing.
- C-884 Test Method for Thermal Compatibility Between Concrete and an Epoxy Resin Overlay.
- D-570 Water Absorption of Plastics.
- D-695 Compression Properties of Rigid Plastic.

B. Military Specifications (Mil. Spec.)

- MIL D-3 134 F (Impact Resistance) Section 4.7.3.
- MIL D-3 134 F (Indentation Resistance) Section 4.7.4.
- MIL D-3234 F (Resistance to Elevated Temperature) Section 4.7.5.

C. ACI 301 Specifications for Structural Concrete for Buildings (most recent edition). Committee in Concrete 403 bulletin 59-43, Bond Strength to Concrete.

SECTION 096505 – RESINOUS FLOORING (BASE BID) (continued):

1.03 DEFINITIONS

- A. Fluid Applied Urethane Resin Cement Flooring specified under this section is referenced on the drawings as Resinous Flooring - RFL.

1.04 SYSTEM DESCRIPTION

- A. System shall be a 1/8" textured urethane cement surfacing with broadcast solid colored quartz or silica to form a skid-resistant surface. Pigmented finish topcoat(s) shall be as specified in Section 2.01.A.

1.05 SUBMITTALS

- A. Samples: Submit a minimum of three standard size cured samples of flooring system indicating color and non-skid properties. Approved samples will be used during installation for product match.
- B. Certified Test: Submit two copies of supplier's/manufacture's written certification that flooring system meets or exceeds required properties.
- C. Manufacturers Application Instructions: Submit descriptive data and specific recommendations for mixing, application, curing including any precautions of special handling instructions required to comply with the Occupational Safety and Health Act.
- D. Shop Drawings: Shop Drawings shall be furnished showing installation of cove base, termination details and details at floor material transitions and where adjoining equipment.
 - 1. Locate and provide written detailing of treatment for all types of concrete substrate joints and repair of cracks required for flooring in area of installation.
- E. Maintenance Instructions: Submit current copies of the flooring manufacturer's printed recommendations on maintenance methods and products. Submit in accordance with Section 01730 - Operation and Maintenance Manuals.

1.06 QUALITY ASSURANCE

- A. Materials used in the floor surfacing shall be the products of a single manufacturer.
- B. Installation shall be performed by an applicator with minimum 3 years experience in work of similar nature and scope. Installer must be approved by the manufacturer of the floor surfacing materials. The general contractor shall furnish a written statement from the manufacturer that the installer is acceptable.
- C. General Contractor to verify locations of all joints required by the provisions of this Section and Section 3300 Cast-In-Place-Concrete and by the recommendations of the related material manufacturers.
 - 1. Joint locations may or may not be shown in drawings.
 - 2. Refer to drawings required under SUBMITTALS above.
- D. Installer to keep daily log of the date of installation, room number, type, color, and method of application of product being installed. Log must be available for inspection by the Architect upon request.
- E. Installer must have proven experience or training approved by flooring system manufacturer with specified system.
- F. Portable mock-up: Prior to starting application of flooring, provide full scale portable mock-up to establish acceptable quality, durability, and appearance. Mock-up size must not be less than 4 square feet.

SECTION 096505 – RESINOUS FLOORING (BASE BID) (continued):

1. Acceptable mock-up to be standard of quality for installed work.
2. Unacceptable installed work to be removed and replaced until acceptable. Aesthetically unacceptable but well bonded work may be overlaid or recoated if thickness clearances permit.

1.07 **PROJECT CONDITIONS**

- A. Maintain the ambient room and the floor temperatures at 60 degrees Fahrenheit, or above, for a period extending from 72 hours before, during and 24 hours after floor installation. Concrete to receive surfacing shall have cured for at least 28 days and shall have been free of water for at least 7 days.
- B. Dew Point: Substrate temperature must be minimum of 5 degrees above dew point prior to, during or up to 24 hours after application of flooring system.
- C. Illumination: Apply flooring system only where a minimum of 30 footcandles exist when measured 3 feet from surface.
- D. Advise other trades of fixtures and fittings not to be installed until flooring is cured and protected.

1.08 **PROTECTION**

- A. Protect adjacent surfaces not scheduled to receive the flooring by masking, or by other means, to maintain these surfaces free of the flooring material.
- B. Provide adequate ventilation and fire protection at all mixing and placing operations. Prohibit smoking or use of spark or flame producing devices within 50 feet of any mixing or placing operation.
- C. Provide polyethylene or rubber gloves or protective creams for all workmen engaged in applying products.

1.09 **PRODUCT DELIVERY, STORAGE, AND HANDLING**

- A. All materials shall be delivered to project site in original manufacturer's sealed containers including type of material, batch numbers, date of manufacture, and pertinent labels intact and legible.
- B. Store materials in dry protected area at a temperature between 60° F to 80° F.
- C. Follow all manufacturer's specific instructions and prudent safety practices for storage and handling.

1.10 **WARRANTY**

- A. Contractor to guarantee work under this Section to be free from defects of material and installation for the duration of the warranty period. Defects occurring during warranty period shall be repaired, in a manner satisfactory to the Owner and the Architect, at no additional cost to the Owner.

1. Warranty Period: One (1) Year.

PART 2 - PRODUCTS

2.01 **MANUFACTURERS**

- A. Specifications and quality of design standard (basis of design) based on Key Resin Company: Key Urecon SLT, using Key Urecon 16 formulation.
Key Resin Company: 888-943-4532, www.keyresin.com OR Approved Equal.

SECTION 096505 – RESINOUS FLOORING (BASE BID) (continued):

- B. System description: Heavy duty, three-component urethane resin modified cementitious topping broadcast with colored quartz or silica aggregate and sealed with Key #625 Bis-F Chemical Resistant Epoxy Sealer.
- C. Alternative manufacturers must have as a minimum the standards set forth in this specification and must be preapproved in accordance with project requirements.

2.02 MATERIALS

- A. Key Urecon SLT mixed according to manufacturer's recommendation and tested as supplied. All specimens cured for 7 days at 75 degrees plus or minus 2 degrees Fahrenheit and 50% plus or minus 2% R.H. The product shall meet the following requirements:

<u>Property</u>	<u>Requirement</u>
Flexural Strength (ASTM C-580)	2600 psi
Tensile Strength (ASTM C-307)	1100 psi
Compressive Strength (ASTM C-579, 7 days)	7500 psi
Coefficient of Thermal Expansion (ASTM C-531)	2×10^{-5} per °F
Density	125-130 lbs/ft ³
Flammability (ASTM-D-635)	Self Extinguishing
Bond Strength (ACI COMM #403)	100% concrete failure minimum, with 300 psi minimum tensile strength
Fungus & Bacteria Growth (MIL-F-52505)	Will not support growth
Hardness (ASTM D-2240)	80-85 Shore D
Thermal Shock Resistance (ASTM C-884)	Passes
Impact Resistance (MIL-D-3134F)	Withstands 16 ft./lbs. without cracking, delamination or chipping
Chemical Resistance (ASTM-D-1308)	Passes

- B. Mixing: Urecon SLT is supplied as a complete three component unit consisting of reactive urethane ingredients and selected fillers and aggregates. Components are thoroughly blended according to manufacturer's recommendations.
- C. Provide slip-resistant, cleanable textured finish. Samples to be approved by Architect and Owner.
- D. Finish: Color as selected by Architect or Owner from the manufacturer's standard colors.
- E. Provide 6" inch integral coved base.

PART 3 - EXECUTION

3.01 PREPARATION

- A. Obtain Architect's approval of mock-up before installing flooring; see QUALITY ASSURANCE in PART 1.
- B. Preparation of Surface:
 - 1. Inspect surfaces to receive flooring and verify that condition is smooth and free from conditions that will adversely affect execution, permanence or quality of work.
 - a. Remove all projections, all debris detrimental to flooring system, dirt, oil contaminates, grease and surface coatings affecting bond.
 - 2. Notify Architect in writing prior to commencing work of any conditions deemed unsatisfactory for the installation; installation of flooring materials is understood as acceptance of the substrate as satisfactory.

SECTION 096505 – RESINOUS FLOORING (BASE BID) (continued):

3. Concrete: The General Contractor shall be responsible for hiring an independent testing service to test for moisture content and moisture vapor emission rate; install no flooring over concrete until the concrete has been cured and is sufficiently dry to achieve permanence with flooring as determined by material manufacturer's recommended bond and moisture tests.
 - a. Effectively remove concrete laitance by steel shot blasting or other method approved by flooring manufacturer.
 - b. Concrete slab shall have an efficient puncture-resistant moisture vapor barrier 10 mils thick minimum directly under the concrete slab (for slab on grade). Do not use vapor barrier manufactured with recycled material. Testing must be done to verify that the moisture vapor emission rate of the slab does not exceed that as recommended by the manufacturer at time of installation of the flooring or at any future date. Moisture vapor emission and moisture content testing must conform with the requirements of ASTM F-1869-11 (Calcium Chloride Test) and ASTM F-2170-11 (Relative Humidity Probe Test).
 - c. Both tests shall be completed by an independent third party. Cost of this testing is the responsibility of the General Contractor. Test results shall be documented and retained. A copy shall be given to the General Contractor, Flooring subcontractor and Architect within 72 hours of results.
 - d. If test results show excessive levels of moisture content or vapor emission rate, installation shall not proceed until source of excessive moisture is identified and removed or corrected.
 - e. If excessive moisture cannot be removed or prevented, apply manufacturer's recommended moisture vapor emission control material. Cost of this remediation shall be included as an alternate.
 - f. Treat cracks in concrete using manufacturer's recommended practice. Rout out crack and fill with Key Urecon material. Do not coat surface with flexible crack isolation membrane treatment unless approved by Key Resin Technical Service.

3.02 INSTALLATION

- A. Install all floor materials in strict conformance with manufacturer's instructions.
- B. Route out all cracks (larger than 1/16" width) and fill with Key Urecon 16 material. Do not coat surface with flexible crack isolation membrane treatment unless approved by Key Resin Technical Service. All free edges (perimeters or along gutters or drains) require extra anchor to distribute mechanical and thermal stresses. All control joints, expansion joints and cold joints must be exposed through the system. Exception: Control joints may be filled with rigid epoxy or Urecon, reinforced with fiberglass cloth and covered with Urecon flooring system if owner's representative confirms in writing that potential for future hairline crack development is acceptable.
- C. Integral Cove Base: Provide integral cove base formed from flooring up concrete block wall or cement board if gypsum drywall is specified. Provide cove base cap strip at top of base as recommended by flooring manufacturer and trowel material up wall to form smooth, integral transition and base 6" inches high.
- D. Primer: Mix and apply Key Resin Urecon SC Primer @ 100 - 120 sq. ft. per gallon.
- E. Broadcast: Broadcast Key 30 Mesh Aggregate into wet primer @ 10 -15 lb. per 100 sq. ft.
- F. Body Coat: Mix and apply Key Urecon SL @ 3/16"
- G. Broadcast: Broadcast Key Broadcast Aggregate into wet Body Coat @ 45 - 50 lb. per 100 sq. ft. Sweep and vacuum excess aggregate from the surface after Body Coat has cured.
- H. Grout Coat: Mix and apply Key Resin # 625 Chemical Resistant C Epoxy Coating @ 80 - 90 sq. ft. per gallon.
- I. Finish Coat: Mix and apply Key Resin # 467 HS Urethane @ 450 sq. ft. per gallon.

SECTION 096505 – RESINOUS FLOORING (BASE BID) (continued):

- J. Place Key Urecon 16 mixture and spread with gauge rake or V-notched trowel or squeegee to a dense flat surface.
- K. Maintaining a wet edge between mixes, push material back into previous mix and pull forward with trowel, squeegee or gauge rake to establish thickness. Before surface has set, broadcast colored quartz or silica aggregate to excess. Allow to cure minimum of 8 hours at room temperature (75 degrees F) and sweep/vacuum excess aggregate from surface.
- L. Seal surface with Key #625 Bis-F Chemical Resistant Epoxy Sealer following recommended recoat and cure times. Be careful not to puddle resin.
- M. Match finished work to approved sample; uniform in thickness, color, texture and free from defects detrimental to appearance.
- N. Apply temporary protection until floor is fully cured. The General Contractor shall protect the finished floor from the time that the sub-contractor completes the work.

END OF SECTION 096705

SECTION 096710 – RESINOUS FLOORING (ALTERNATE)

PART 1 – GENERAL

1.01 SUMMARY

A. Section Includes:

1. Fluid applied seamless flooring with integral cove base.
2. Joint, edge, and termination strips.
3. Prior to installation of structural floor slab, advise General Contractor and Construction Manager, in writing, of all requirements of concrete substrate regarding finish, level tolerance, and curing; see INSPECTION in Part 3.
4. Locate all flexible joints required. See submittals below.
5. Accessories necessary for complete installation.

B. Related Sections:

1. Cast-in-Place Concrete: Section 033000.
 - a. Concrete sub-floor to be level (maximum variation not to exceed ¼ inch in 10 feet) and to have a steel troweled finish. No curing agents or other additives which could prevent bonding should be used unless the mechanical surface preparation method completely removes the curing agent residue or sealer.
 - b. Slabs on grade must have an efficient puncture resistant vapor barrier placed directly under the slab.
2. Sealants: Division 7.
3. Gypsum Drywall: Division 9.
4. Adjacent floor finishes: Division 9.

1.02 REFERENCE STANDARDS

The publications listed below from a part of this specification to the extent referenced. The publications are referred to in the text by the basic designation only.

A. American Society for Testing and Materials (ASTM) Publications:

- C-307 Test Method for Tensile Strength of Chemical-Resistant Mortars.
- C-501 Test Method for Relative Resistance to Wear Unglazed Ceramic Tile by the Taber Abraser.
- C-531 Test Method for Linear Shrinkage and Coefficient of Thermal Expansion of Chemical-Resistant Mortars, Grouts, and Monolithic Surfacing.
- C-579 Test Methods for Compressive Strength of Chemical-Resistant Mortars and Monolithic Surfaces.
- C-580 Test Method for Flexural Strength and Modulus of Elasticity of Chemical-Resistant Mortars, Grouts, and Monolithic Surfacing.
- C-884 Test Method for Thermal Compatibility Between Concrete and an Epoxy Resin Overlay.
- D-570 Water Absorption of Plastics.
- D-695 Compression Properties of Rigid Plastic.

B. ACI 301 Specifications for Structural Concrete for Buildings (most recent edition). Committee in Concrete 403 bulletin 59-43, Bond Strength to Concrete.

1.03 DEFINITIONS

- A. Epoxy Resin Flooring specified under this section is referenced on the drawings as Resinous Flooring - RFL.

1.04 SYSTEM DESCRIPTION

- A. System shall be 1/8 inch textured epoxy surfacing with broadcast aggregate to form a skid resistant surface. Surface finish shall be a two component, chemical resistant epoxy, Key #625.

SECTION 096710 – RESINOUS FLOORING (ALTERNATE) (continued):

1.05 SUBMITTALS

- A. Samples: Submit 6 by 6 inch cured samples of flooring system indicating color combination and non-skid properties. Approved samples will be used during installation for product match.
- B. Certified Test: Submit two copies of suppliers/ manufacturers written certification that flooring system meets or exceeds required properties.
- C. Manufacturers Application Instructions: Submit descriptive data and specific recommendations for mixing, application, curing including any precautions of special handling instructions required to comply with the Occupational Safety and Health Act.
- D. Shop Drawings: Shop Drawings shall be furnished showing installation of cove base and termination details, and details at floor material transitions and where adjoining equipment.
 - 1. Locate and provide detailing for flexible joints required for flooring in area of installation.
- E. Maintenance Instructions: Submit current copies of the flooring manufacturer's printed recommendations on maintenance methods and products. Submit in accordance with Section 01730 - Operation and Maintenance Manuals.

1.06 QUALITY ASSURANCE

- A. Materials used in the floor surfacing shall be the products of a single manufacturer.
- B. Installation shall be performed by an applicator with minimum 3 years experience in work of similar nature and scope. Installer must be approved by the manufacturer of the floor surfacing materials. The contractor shall furnish a written statement from the manufacturer that the installer is acceptable.
- C. Installer to verify locations of all flexible joints required by the provisions of this Section and by the recommendations of the related material manufacturers.
 - 1. Joint locations may or may not be shown in drawings.
 - 2. Refer to drawings required under SUBMITTALS above.
- D. Installer to keep daily log of the date of installation, room number, type, color, and method of application of product being installed. Log must be available for inspection by the Architect upon request.
- E. Contractor to have proven experience with specified system.
- F. Portable mock-up: Prior to starting application of flooring, provide full scale portable mock-up to establish acceptable quality, durability, and appearance. Mock-up size must not be less than 4 square feet.
 - 1. Acceptable mock-up to be standard of quality for installed work.
 - 2. Unacceptable installed work to be removed and replaced until acceptable. Aesthetically unacceptable but well bonded work may be overlaid or recoated per Manufacturer's instructions if thickness clearances permit.
- G. Qualifications:
 - 1. Installer: Must be acceptable to Architect, and Manufacturer.

SECTION 096710 – RESINOUS FLOORING (ALTERNATE) (continued):

1.07 PROJECT CONDITIONS

- A. Maintain the ambient room and the floor temperatures at 60 degrees Fahrenheit, or above, for a period extending from 72 hours before, during and after floor installation. Concrete to receive surfacing shall have cured for at least 28 days and shall have been free of water for at least 7 days.
- B. Dew Point: Substrate temperature must be minimum of 5 degrees above dew point prior to, during or up to 24 hours after application of flooring system.
- C. Illumination: Apply flooring system only where a minimum of 30 footcandles exist when measured 3 feet from surface.
- D. Advise other trades of fixtures and fittings not to be installed until flooring is cured and protected.

1.08 PROTECTION

- A. Protect adjacent surfaces not scheduled to receive the flooring by masking, or by other means, to maintain these surfaces free of the flooring material.
- B. Provide adequate ventilation and fire protection at all mixing and placing operations. Prohibit smoking or use of spark or flame producing devices within 50 feet of any mixing or placing operation.
- C. Provide polyethylene or rubber gloves or protective creams for all workmen engaged in applying products containing epoxy.

1.09 PRODUCT DELIVERY, STORAGE, AND HANDLING

- A. All materials shall be delivered to project site in original manufacturer's sealed containers including type of material, batch numbers, date of manufacture, and pertinent labels intact and legible.
- B. Store materials in dry protected area at a temperature between 60° F to 80° F.
- C. Follow all manufacturer's specific instructions and prudent safety practices for storage and handling.

1.10 WARRANTY

- A. Contractor to guarantee work under this Section to be free from defects of material and installation for the duration of the warranty period. Defects occurring during warranty period shall be repaired, in a manner satisfactory to the Owner and the Architect, at no additional cost to the Owner.

- 1. Warranty Period: One (1) Year.

PART 2 - PRODUCTS

2.01 MANUFACTURERS

- A. Specifications and quality of design standard (basis of design) based on Key Resin Company: Key Mortar SLT Key Resin Company: 888-943-4532, www.keyresin.com OR Approved Equal.
- B. System description: Heavy duty, three-component epoxy resin surfacing broadcast with silica aggregate for non-skid texture.
- C. Alternative manufacturers must have as a minimum the standards set forth in this specification and must be preapproved in accordance with project requirements.

SECTION 096710 – RESINOUS FLOORING (ALTERNATE) (continued):

2.02 MATERIALS

- A. Cementitious Tile Backboard: See Section 09250 - Gypsum Drywall.
- B. Prime Coat: Two component penetrating damp-proof epoxy.
- C. Aggregates:
 - 1. Blended aggregate for base.
 - 2. Broadcast silica with a minimum Mohs. hardness of 6.
- D. Matrix: Matrix-epoxy/aggregate composition.
- E. Grout and Topcoats:
 - 1. Two component epoxy grout, Key #510 pigmented.
 - 2. Two component epoxy sealer, Key #450 Urethane pigmented.

2.04 MIXING

- A. Apply flooring to specified physical properties.
- B. Provide slip-resistant, cleanable textured finish. Samples to be approved by Owner and Architect.

2.05 FINISHES

- A. Color as selected by Architect or Owner from the manufacturer's standard colors.

PART 3 - EXECUTION

3.01 PREPARATION

- A. Obtain Architect's approval of mock-up before installing flooring; see QUALITY ASSURANCE in PART 1.
- B. Preparation of Surface:
 - 1. Inspect surfaces to receive flooring and verify that condition is smooth and free from conditions that will adversely affect execution, permanence, or quality of work.
 - a. Remove all projections, all debris detrimental to flooring system, and dirt, oil contaminates, grease, and surface coatings affecting bond.
 - 2. Notify Architect or Owner in writing prior to commencing work of any conditions deemed unsatisfactory for the installation; installation of flooring materials is understood as acceptance of the substrate as satisfactory.
 - 3. Concrete: The General Contractor shall be responsible for hiring an independent testing service to test for moisture content and moisture vapor emission rate; install no flooring over concrete until the concrete has been cured and is sufficiently dry to achieve acceptable bond with flooring as determined by material manufacturer's recommended bond and moisture tests.
 - a. Effectively remove concrete laitance by steel shot blasting or other method approved by flooring manufacturer.
 - b. Concrete slab shall have an efficient puncture-resistant moisture vapor barrier 10 mils thick minimum placed directly under the concrete slab (for slab on grade). Testing must be done to verify that the moisture vapor emission rate of the slab does not exceed that as recommended by the manufacturer at time of installation of the flooring or at any future date.

SECTION 096710 – RESINOUS FLOORING (ALTERNATE) (continued):

- Moisture vapor emission and moisture content testing must conform with the requirements of ASTM F-1869-98 (Calcium Chloride Test) and ASTM F-2170-02 (Relative Humidity Probe Test).
- c. Both tests shall be completed by an independent third party. Cost of this testing is the responsibility of the General Contractor. Test results shall be documented and retained. A copy shall be given to the General Contractor, Flooring subcontractor and Architect within 72 hours of results.
 - d. If test results show excessive levels of moisture content or vapor emission rate, installation shall not proceed until source of excessive moisture is identified and removed or corrected.
 - e. If excessive moisture cannot be removed or prevented, apply manufacturer's recommended moisture vapor emission control material. Cost of this remediation shall be included as an alternate.
 - f. Treat cracks in concrete using manufacturer's recommended practices. Rout out crack and fill with rigid epoxy; Reinforce crack with fiberglass cloth. Refer to section 3.02.B.

3.02 INSTALLATION

- A. Install all floor materials in strict conformance with manufacturer's instructions.
- B. Route out all cracks (larger than hairline width) and fill with Key Crack Filler or other material approved by Manufacturer of floor materials. Reinforce crack with fiberglass cloth using Key #502 Primer or the epoxy used to fill the crack.
- C. Primer: Mix and apply Key Resin # 502 Epoxy Primer @ 200 - 250 sq. ft. per gallon.
- D. Broadcast: Broadcast Key 30 Mesh Aggregate into wet primer @ 10 -15 lb. per 100 sq. ft.
- E. Body Coat: Mix and apply Key # 511 Epoxy Binder + Key SL Filler @ 45 sq. ft. per mixed gallon (90 mils DFT).
- F. Broadcast: Broadcast Key 30 Mesh Aggregate into wet Body Coat @ 45 - 50 lb. per 100 sq. ft. Sweep and vacuum excess aggregate for m the surface after Body Coat has cured.
- G. Grout Coat: Mix and apply Key Resin # 625 Chemical Resistant Epoxy Coating @ 80 - 90 sq. ft. per gallon.
- H. Finish Coat: Mix and apply Key Resin # 467 HS Urethane @ 450 sq. ft. per gallon.
- I. Prime entire surface with recommended primer.
- J. Apply epoxy and broadcast aggregate to achieve a minimum thickness of 1/8 inch.
- K. Apply epoxy grout and Urethane seal coats to provide a uniform, dense surface.
- L. Match finished work to approved samples, uniform in thickness, sheen, color, pattern and texture, and free from defects detrimental to appearance.
- M. Integral Cove Base: Provide integral cove base formed from flooring over tile backerboard as specified under Division 9 - Gypsum Drywall. Provide cove cap strip at top of base as recommended by flooring manufacturer and trowel material up wall to form smooth, integral transition and base 6 inches high unless otherwise indicated or scheduled.
- N. Apply temporary protection until floor is fully cured. The General Contractor shall protect the finished floor from the time that the sub-contractor completes the work.

END OF SECTION 096710

SECTION 096816 – CARPETING

PART 1 - GENERAL

- 1.01 Submittals: Submit product binder of each required type, color, pattern and texture of carpet and samples of edge stripping.
- 1.02 Layout plan: Submit a working layout for each area to be covered showing the location of seams, for review and approval.
- 1.03 Testing: Submit certified test reports showing compliance with Fire Performance Characteristics and Physical Properties indicated. Tests shall be conducted on actual piece(s) of carpet to be installed by an approved independent Testing Lab.
- A. Carpet Flammability: Pass Methenamine Pill Test, ASTM D 2859.
 - B. Floor Radiant Panel Test: NFPA Class 1, ASTM E 648 (Glue down).
 - C. Critical Radiant Flux: Minimum of 0.45 W/sq cm (Class I).
 - D. Smoke Density Test: 450 or less, NFPA 258.
 - E. Static Electricity: 1.5 KV max. at 70 deg. F and 20 percent relative humidity, AATCC 134.
 - F. Fade Resistance: Value of 4 for 40 hours, AATCC 16E.
 - G. CRI Indoor Air Quality Carpet Testing Program: Carpet shall bear label meaning that carpet and carpet cushion and adhesive have been tested and have passed all three IAQ Carpet Testing Program requirements.
- 1.04 Extra material: Furnish 2% additional stock from the same production run as the materials applied. Package with protective covering for storage and identify with labels describing contents. Deliver extra materials to Owner. The Owner shall be permitted to inspect waste carpet scraps, so he may retain any for future repairs before they are removed from the jobsite. Usable pieces of carpet not necessary to complete the work are to be left on the jobsite and placed in an orderly manner in such an area as designated by the Owner.
- 1.05 Product, Delivery and Handling: Carpet will be delivered to the jobsite in the original mill wrappings with each roll having its size, dyelot, material and register number properly marked on each bale. The carpet shall be stored under cover in dry, well ventilated spaces as soon as it is delivered to the jobsite and the Contractor shall protect it from damage, dirt, stains and moisture.
- 1.06 Field Verification: Contractor shall field verify and measure all conditions affecting the installation of the carpet. Contractor will be responsible for proper installation of carpet in designated areas.
- 1.07 Substrate Testing:
- A. Moisture Testing: Perform tests recommended by manufacturer **and as follows**. Proceed with installation only after substrates pass testing. Testing shall be done by an independent third party.
 - 1. Perform relative humidity test using in situ probes, ASTM F 2170. Proceed with installation only after substrates have a maximum relative humidity level measurement within the manufacturer's required range.
 - 2. Both tests shall be done. Results shall be documented and retained. A copy shall be submitted to the Architect and Flooring Subcontractor within 72 hours.

SECTION 096816 – CARPETING (continued):

3. Installation of flooring shall not begin until moisture tests are within the required range.
- 1.08 Warranty: Manufacturer's limited lifetime wear and backing warranty.

PART 2 – PRODUCTS

2.01 Interior Carpet Materials and Construction:

- A. Carpet – CPT-1: Provide “Circuit” by Mannington Commercial Carpet, OR approved equal
 1. Face Yarn: Antron Lumena, Type 6, 6
 2. Weave/Surface Texture: Patterned loop
 3. Gauge: 5/64 inch.
 4. Weight: 20 oz./sq. yd.
 5. Density: 6667
 6. Backing Construction: Infinity modular
 7. Size: Modular, 24” x 24”
 8. Color: See Color Legend on Finish Plans.
 9. Installation: Horizontal Brick Ashlar.

2.02 Miscellaneous Materials and Carpet Accessories:

- A. Resilient Transition Strip: See General Finish notes in the finish plans.
- B. Installation Adhesive: Provide adhesive as recommended by carpet manufacturer.
- C. Miscellaneous Materials: Products of type recommended by manufacturer and Installer.

PART 3 - EXECUTION

- 3.01 Clean surfaces to be carpeted; scrape up cementitious and resinous deposits; vacuum; apply sealer on concrete surfaces, adequate to prevent dusting.
Note: Carpet installation shall not commence until Contractor has approval from Architect.
- 3.02 Pre-plan installation for uniform lay of pile, minimum number of seams and proper sequencing with other work. Locate seams properly, centered under doors and without seams in direction of traffic at doorways and similar traffic patterns. Do not bridge building expansion joints. Extend carpet under removable obstructions and into closets and alcoves.
- 3.03 Manufacturer’s Instructions: Comply with manufacturer’s installation instructions and recommendations.
- 3.04 Glue-down adhesive shall be installed exactly as carpet manufacturer prescribes.
- 3.05 Install edge guards at exposed edges.
- 3.06 Clean adhesive and cement from face of carpet promptly; replace carpet which cannot be cleaned.
- 3.07 Save carpet scraps and deliver to Owner's storage space as directed. Dispose of pieces smaller than 18" x 18".
- 3.08 Vacuum completed carpet installation with beater-in-nozzle type commercial vacuum cleaner. Remove any protruding face yarn with sharp scissors.

SECTION 096816 – CARPETING (continued):

- 3.09 All carpet shall be protected from damage after installation and before substantial completion with two (2) alternating layers of heavy craft paper. Clean carpet as recommended by manufacturer.

END OF SECTION 096816

SECTION 097730 - EPOXY RESIN WALL SYSTEM

PART 1 - GENERAL

1.01 WORK INCLUDED

- A. Furnish all necessary materials, labor, and equipment required to install Epoxy/Urethane Wall Finish System.

1.02 RELATED WORK

- A. All drawings and general provisions of contract including General and Special Conditions and Division I, excepting special Submittal and Quality Assurance provisions in this Section.
 - 1. UNIT MASONRY - Division 4
 - 2. GYPSUM BOARD - Division 9
 - 3. FLOORING - Division 9

1.03 QUALITY ASSURANCE

- A. Manufacturer's Qualifications
 - 1. Obtain Epoxy/Urethane Wall Finish System materials from a single manufacturer providing materials of the type specified in this section.
 - 2. The Epoxy/Urethane Wall Finish System manufacturer shall provide detailed installation instructions to the applicator's crew.

- B. Applicator Qualifications

Installation shall be performed by a contractor with skilled mechanics having not less than three years of satisfactory experience in the application of the type of system as specified in this section, and shall be approved by the manufacturer of the Epoxy/Urethane Wall Finish System.

1.04 WARRANTY

- A. The contractor shall furnish a standard maintenance guarantee of the Epoxy/Urethane Wall Finish System for a period of one year after installation. This maintenance guarantee includes loss of bond and top-side degradation due to normal use. Not included are bubbling or loss of adhesion due to moisture penetration through the substrate, damage due to Acts of God, vandals or other elements beyond the scope of protection of this system, or claims resulting from damage due to a change in use of area in which the Epoxy/Urethane Wall Finish System is installed. Also excluded are reflective cracks from substrate. In case of a warranty claim, the owner will notify the manufacture and applicator in writing within 30 days of the first appearance of any problems which are covered under this warranty, and will provide free access to the area during normal working hours. Property protection is also the owner's responsibility. Remedy is limited to direct repair of the Epoxy/Urethane Wall Finish System.

1.05 SUBMITTALS

- A. Product Data:

- 1. Submit manufacturer's specifications on specific products of the Epoxy/Urethane Wall Finish System, including physical properties and performance properties, including all tests described in part 2.01A in this Section and Material Safety Data Sheets. Manufacturer's standard color charts shall also be submitted, and must afford the owner color selection from at least 12 standard colors. Furnish three sets of this information.

SECTION 097730 - EPOXY RESIN WALL SYSTEM (continued):

2. The applicator shall submit a 6" x 6" system sample for verification purposes and finish texture approval.
 3. The applicator shall submit a copy of the manufacturer's bill of material, tagged for this specific job, along with calculations, signed by an officer of the primary material supplier demonstrating that the quantity of material furnished for the project will achieve the specified coverage and mil thicknesses.
- B. It is the intention of this Section to provide the products as named. Substitutions will be considered only when received by the Design Professional through a bidding Prime Contractor at least ten days prior to the date set of receipt of bids. Upon receipt of any such submission, the Design Professional will determine whether or not the proposed product is an approved equal. In the event the Design Professional determines that a proposed system is an approved equal, he will issue an addendum and notify all bidders at least 48 hours prior to receipt of bids.

1.06 **MATERIAL DELIVERY, HANDLING, AND STORAGE**

- A. Primary system materials shall be delivered in the manufacturer's undamaged, unopened containers. Each container shall be clearly marked with the following:
1. Product name
 2. Manufacturer's name
 3. Component designation (A or B, etc.)
 4. Ratio of component mixture
- B. Provide equipment and personnel to handle the materials by methods which prevent damage.
- C. The applicator shall promptly inspect all direct job-site deliveries to assure that quantities are correct and that materials comply with requirements and are not damaged.
- D. The applicator shall be responsible for all materials shipped to the project jobsite.
- E. Store materials in accordance with manufacturer's instructions, with seals and labels intact and legible. Maintain temperatures within the required range. Do not use materials which have been stored for a longer period of time than the manufacturer's maximum recommended shelf life.

1.07 **JOB CONDITIONS**

- A. The applicator should exercise care during surface preparation and system application to protect surrounding substrates and surfaces, as well as in-place equipment. The applicator shall use his discretion as to the physical means and methods used for preparation and protection. Any costs incurred for resultant damage from negligence or inadequate protection shall be the sole responsibility of the applicator.
- B. During material application, care should be exercised to comply with the temperature and humidity limitations of the materials used as defined by the manufacturer.

PART 2 - PRODUCTS

2.01 **MATERIALS**

- A. **System Overview:** The system as formulated by Key Resin Company shall be 20 - 30 mil, epoxy and urethane wall finish system using Key #544 100% Solids Epoxy Wall Coating and Key #467 HS Urethane Sealer. This system shall be applied over a clean, prepared substrate. The system is to be

SECTION 097730 - EPOXY RESIN WALL SYSTEM (continued):

applied over appropriate primer and/or block filler as recommended by Key Resin Company for each type of substrate. The finished surface shall be dense, non-porous and have a light orange peel finish.

- B. Epoxy Block Filler or Polymeric Block Filler: The block filler shall be epoxy or acrylic-modified cement (polymeric), one of the following options: Key #553 Epoxy Block Filler, Key #554 Epoxy Block Filler, or Key Polymeric Block Filler as manufactured by Key Resin Company, with performance properties as outlined in the product data sheets. Latex block fillers are not acceptable.
- C. Epoxy Primer: The epoxy primer shall be Key #502 manufactured by Key Resin Company. Primer is not required if Epoxy Block Filler is to be used.
- D. High Performance Epoxy Coating: The high performance epoxy coating shall be Key #544 Epoxy Coating as manufactured by Key Resin Company, with performance properties as outlined in the product data sheet.
- E. High Performance Aliphatic Urethane Sealer:
The high performance aliphatic urethane sealer shall be Key #467 HS Low Odor Urethane Sealer as manufactured by Key Resin Company, with performance properties as outlined in the product data sheet.

PART 3 - EXECUTION

3.01 SURFACE PREPARATION

- A. Prepare substrate to provide clean surface with open pores removing all contaminating or bond breaking substances including but not limited to dust, laitance, curing compounds, coatings, form release agents, sealers, oil, and grease. All spalled or deteriorated areas should be mechanically removed by chipping hammers. Level any surface projections and mortar spatters by grinding, stoning, or scraping. Rake mortar joints clean.

3.02 APPLICATION

- A. General: Apply each component of the Epoxy/Urethane Wall Finish System in compliance with manufacturer's instructions including mixing and application methods, recoat windows, cure times and environmental restrictions.
- B. Epoxy Block Filler or Polymeric Block Filler (REQUIRED ONLY FOR CONCRETE BLOCK, or CONCRETE IMPERFECTIONS): Spread thoroughly blended Key #553, Key #554, or Key Polymeric block filler over the substrate with a flat steel trowel, roller, or brush at the rate required to fill irregularities and mortar joints, and create a smooth sub-surface for epoxy wall system. Multiple coats may be required to achieve proper finish. Allow proper cure time between coats and before epoxy top coats.
- C. Epoxy Primer: Prime all substrates which have not been coated with epoxy block filler at the rate of 200 - 250 square feet per gallon using Key #502 epoxy primer. Allow to cure. Dry wall substrates may require two coats of primer due to absorption.
- D. Epoxy Base Coats: Apply thoroughly mixed 100% solids Key #544 epoxy coating at the rate of 160-200 square feet per gallon to primed or filled wall to yield 8-10 dry mils. Allow to cure 12 hours. Apply one or two additional coats at 160-200 sq. ft. per gallon per coat, following recommended recoat cure time.
- E. Sanding: Sand any imperfections in the epoxy base coats such as runs and sags to achieve a smooth

SECTION 097730 - EPOXY RESIN WALL SYSTEM (continued):

uniform base. Final topcoat will have a light orange peel finish and should match approved sample.

- F. Urethane Sealer: Apply thoroughly mixed low odor Key #467 HS urethane sealer at the rate of 450 - 500 square feet per gallon to yield 3 dry mils. Urethane must be applied within the Key #544 recoat window unless the epoxy has been thoroughly sanded. Allow to cure.
- G. Obtain Architect's/Owner's approval of the system just after completion of the final coat, prior to completion of curing.

3.03 CURING, CLEANING, AND PROTECTION

- A. Cure all Epoxy/Urethane Wall Finish System materials in compliance with manufacturer's directions, taking care to prevent contamination during stages of the application and prior to completion of the curing process.
- B. The General Contractor shall protect the finished Epoxy/Urethane Wall Finish System from the time that the sub-contractor completes the work.

END OF SECTION 097730

SECTION 099100 – PAINTING

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

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

1.02 DESCRIPTION OF WORK

- A. Painting and finishing of interior and exterior items and surfaces, unless otherwise indicated.
- B. Includes field painting of bare and covered pipes and ducts (including color coding), and hangers, exposed steel and iron work, and primed metal surfaces of equipment installed under mechanical and electrical work.
- C. Paint exposed surfaces, except as otherwise indicated, whether or not colors are designated. If not designated, colors will be selected by Architect from designer colors available for the coatings required.

1.03 WORK NOT INCLUDED: Unless otherwise indicated, shop priming of ferrous metal items and fabricated components are included under their respective trades. Pre-finished items, are not included.

- A. Unless otherwise indicated, painting not required on surfaces of concealed areas except for piping, equipment and other such items within concealed spaces. Finished metals such as anodized aluminum, stainless steel, bronze, and similar metals will not be painted. Do not paint any moving parts of operating units, or over any equipment identification, performance rating, name or nomenclature plates or code-required labels.

1.04 RELATED SECTIONS

- A. Section 081113 – Hollow Metal Doors and Frames
- B. Section 092900 - Gypsum Drywall

1.05 FLAME SPREAD RATING

- A. Class A (0-25) over non-combustible surfaces.

1.06 SUBMITTALS: In addition to manufacturer's data, application instructions, and label analysis for each coating material, submit samples for Architect's review of color and texture only. Resubmit samples if requested until required sheen, color and texture is achieved.

- A. On 8" x 8" hardboard, provide samples of each color and material, with texture to simulate finish conditions.
- B. On actual wall surfaces and other building components, duplicate painted finishes of acceptable samples, as directed by Architect. Final acceptance of paint color and texture shall be from wall sample.

1.07 PROJECT CONDITIONS

- A. Do not apply paint in rain, fog or mist or when relative humidity exceeds 85%. Do not apply paint to damp or wet surfaces or before the building is weathered in.

SECTION 099100 - PAINTING (continued):

1.08 EXTRA MATERIALS

- A. Furnish extra paint materials from the same production run as the materials applied. Package with protective covering for storage and identify with labels describing contents. Deliver extra materials to Owner. Furnish Owner with 1 gal. of each material and color applied.

PART 2 - PRODUCTS

2.01 MANUFACTURERS

- A. Provide specified paint by Sherwin-Williams Company OR approved equal by one of the following paint manufacturers:
1. PPG.
 2. Benjamin Moore.

2.02 PAINT MATERIALS - GENERAL

- A. Material Compatibility: Provide block fillers, primers, and finish-coat materials that are compatible with one another and with the substrates recommended by manufacturer.
- B. Material Quality: Provide manufacturer's best-quality paint material of the various coating types specified that are factory formulated and recommended by manufacturer for application indicated. Paint-material containers not displaying manufacturer's product identification will not be acceptable.

2.03 PAINT SCHEDULE

A. Exterior Surfaces:

1. Concrete Masonry Unit -Elastomeric (Exterior): Bare Substrate

Flat Finish

- 1st Coat: S-W Loxon Block Surfacer, A24W200
(50-100 sq ft/gal; VOC 81 g/L, 0.68 lb/gal)
- 2nd Coat: S-W Loxon XP Waterproofing System, A24 Series
- 3rd Coat: S-W Loxon XP Waterproofing System, A24 Series
(18 mils wet, 8.3 mils dry per coat; VOC <50 g/L, <0.42 lb/gal)

Textured - Flat Finish: Bare Substrate bn

- 1st Coat: S-W Loxon Block Surfacer, A24W200
(50-100 sq ft/gal; VOC 81 g/L, 0.68 lb/gal)
- 2nd Coat: S-W Conflex XL textured, A5-800 Series
(16 mils wet, 7.68 mils dry per coat; VOC 48g/L, 0.40 lb/gal)
- 3rd Coat: S-W Conflex XL textured, A5-800 Series
(Fine, Medium, Extra Coarse) (16 mils wet, 7.6 mils dry per coat;
VOC 48 g/L, 0.40 lb/gal)

Concrete Masonry Unit-Elastomeric (Exterior): Previously Coated

- 1st Coat: S-W Loxon Conditioner, A24 Series
- 2nd Coat: S-W Loxon XP Waterproofing System, A24 Series
- 3rd Coat: S-W Loxon XP Waterproofing System, A24 Series
(18 mils wet, 8.3 mils dry per coat; VOC <50 g/L, <0.42 lb/gal)

SECTION 099100 - PAINTING (continued):

B. Interior Surfaces:

1. Gypsum Drywall (Interior):

1st Coat: S-W ProMar 200 Zero VOC Latex Primer, B28W2600
(4 mils wet, 1.5 mils dry; Zero VOC)
2nd Coat: S-W ProMar 200 Zero VOC Latex Eg-Shel, B20-2600 Series
3rd Coat: S-W ProMar 200 Zero VOC Latex Eg-Shel, B20-2600 Series
(4 mils wet, 1.6 mils dry per coat; Zero VOC)

2. Galvanized Metal (Interior):

Primer: S-W Pro-Cryl Universal Primer, B66-310 Series
(5.0-10.0 mils wet, 2.0-4.0 mils dry; VOC <100 g/L, <0.93 lb/gal)
1st Coat: S-W PRO Industrial Acrylic Semi-Gloss Coating, B66-650 Series
2nd Coat: S-W PRO Industrial Acrylic Semi-Gloss Coating, B66-650 Series
(2.5-4 mils dry per coat; VOC 0 g/L)

3. Ferrous Metal (Interior):

Primer: S-W Pro-Cryl Universal Primer, B66-310 Series
(5.0-10.0 mils wet, 2.0-4.0 mils dry; VOC <100 g/L, <0.93 lb/gal)
1st Coat: S-W PRO Industrial Acrylic Semi-Gloss Coating, B66-650 Series
2nd Coat: S-W PRO Industrial Acrylic Semi-Gloss Coating, B66-650 Series
(2.5-4 mils dry per coat; VOC 0 g/L)

4. Gypsum Drywall (Wet Areas or where EP – Epoxy Paint is scheduled on the Finish Plans):

Semi-Gloss Finish

1st Coat: S-W ProGreen 200 Interior Latex Primer, B28W600
(4 mils wet, 1.5 mils dry; VOC 49 g/L, 0.36 lb/gal)
2nd Coat: S-W ProIndustrial Pre-Catalyzed Waterbased Epoxy, K46
3rd Coat: S-W ProIndustrial Pre-Catalyzed Waterbased Epoxy, K46
(4.0 mils wet, 1.5 mils dry per coat; VOC 155 g/L, 1.29 lb/gal)

5. Concrete Masonry Units and Concrete (Interior):

Semi-Gloss Finish

1st Coat: S-W PrepRite Blockfiller , B25W25
(VOC , 50 g/L)
or
S-W Loxon Block Surfacer, A24W200
(VOC, ,100 g/L)
2nd Coat: S-W ProMar 200 Zero VOC Latex Semi-gloss, B31-2600 Series
3rd Coat: S-W ProMar 200 Zero VOC Latex Semi-gloss, B31-2600 Series
(4 mils wet, 1.6 mils dry per coat; Zero VOC)

6. Concrete Masonry Units (Interior): Interior Waterproofing

1st Coat S-W H & C Basement and Masonry Waterproofer: 50.010004
2nd Coat S-W H & C Basement and Masonry Waterproofer: 50.010004
(75-150 sq/ft per gallon per coat)

SECTION 099100 - PAINTING (continued):

7. **Concrete Masonry Units (Where EP-Epoxy Paint is scheduled on finish plans):**
- | | |
|------------|--|
| 1st Coat : | S-W Loxon Block Surfacer, A24W200
(50-100 sq ft/gal; VOC 81 g/L, 0.68 lb/gal) |
| 2nd Coat: | S-W ProIndustrial Pre-Catalyzed Waterbased Epoxy, K46 |
| 3rd Coat: | S-W ProIndustrial Pre-Catalyzed Waterbased Epoxy, K46
(4.0 mils wet, 1.5 mils dry per coat; VOC 155 g/L, 1.29 lb/gal) |

PART 3 - EXECUTION

3.01 **EXAMINATION:**

- A. Examine substrates, areas, and conditions, with Applicator present, for compliance with requirements for paint application.
1. Proceed with paint application only after unsatisfactory conditions have been corrected and surfaces receiving paint are thoroughly dry.
 2. Start of painting will be construed as Applicator's acceptance of surfaces and conditions within a particular area.
 3. Notify Architect about anticipated problems when using the materials specified over substrates primed by others.

3.02 **PREPARATION**

- A. Remove hardware and accessories, machined surfaces, plates, lighting fixtures and similar items in place and not to be finish-painted or provide surface-applied protection. Reinstall removed items and remove protective coverings at completion of work.
- B. Surface Preparation: Clean and prepare surfaces to be painted according to manufacturer's written instructions for each particular substrate condition and as specified.
1. **Cementitious Surfaces:** Prepare concrete, concrete masonry, cement plaster and surfaces to be painted. Remove efflorescence, chalk, dust, dirt, grease, oils, and release agents. Roughen as required to remove glaze. If hardeners or sealers have been used to improve curing, use mechanical methods of surface preparation. Determine alkalinity and moisture content of surfaces to be painted. Do not paint surfaces where moisture content exceeds that permitted in manufacturer's printed directions.
- C. **Ferrous Metals:** Clean non-galvanized ferrous metal surfaces that have not been shop-coated; remove oil, grease, dirt, loose mill scale and other foreign substances. Use solvent or mechanical cleaning methods that comply with recommendations of the Steel Structures Painting Council. Touch-up shop-applied prime coats that have been damaged, and bare areas. Wire-brush, clean with solvents and touch-up with the same primer as the shop coat.
- D. **Galvanized Surfaces:** Clean galvanized surfaces with non-petroleum based solvents so that surface is free of oil and surface contaminants. Remove pretreatment from galvanized sheet metal fabricated from coil stock, by mechanical methods.
- E. **Material Preparation:** Mix and prepare paint materials according to Manufacturer's written instructions.

3.03 **APPLICATION:**

- A. Apply painting and finishing materials in accordance with manufacturer's directions. Use applicators, and techniques best suited for materials and surfaces to which applied.

SECTION 099100 - PAINTING (continued):

- B. Apply additional coats when undercoats, stains or other conditions show through final paint coat, until paint film is of uniform finish, color and appearance.
- C. Paint surfaces behind movable equipment and furniture same as similar exposed surfaces. Paint surfaces behind permanently fixed equipment or furniture with prime coat only before equipment is installed.
- D. Paint interior surfaces of ducts, where visible through registers or grilles, flat, non-specular black.
- E. Paint back sides of access panels, and removable or hinged covers to match exposed surfaces.
- F. Sand lightly between exceeding enamel or varnish coats.
- G. Omit first coat (primer) on metal surfaces which have been shop-primed and touch-up painted, unless otherwise specified.
- H. Apply prime coat to material which is required to be painted or finished, and which has not been prime coated by others.
- I. Apply each material at not less than manufacturer's recommended spreading rate, to provide a total dry film to thickness of not less than 4.0 mils for entire coating system of prime and finish coats for 3-coat work.
- J. Minimum Coating Thickness: Apply paint materials no thinner than manufacturer's recommended spreading rate to achieve dry film thickness indicated. Provide total dry film thickness of the entire system as recommended by manufacturer.

3.05 PROTECTION:

- A. Protect work of other trades. Correct any painting related damages by cleaning, repairing or replacing, and refinishing, as directed by Architect.

3.06 COORDINATION:

- A. Provide finish coats which are compatible with prime paints used. Provide barrier coats over incompatible primers where required. Notify Architect in writing of anticipated problems using specified coatings with substrates primed by others.

3.07 COMPLETED WORK

- A. Match approved samples for color, texture and coverage. Remove, refinish or repaint work not in compliance with specified requirements.

END OF SECTION 099100

SECTION 099500 – VERTICAL METAL WALL PANEL RESTORATION

PART – GENERAL

1.01 SUMMARY

1.02 SCOPE

- A. Scope of Work: Refurbishment of existing exterior vertical metal wall panels using Rust –Go System or approved equal. Damaged panels shall be replaced with new prior to starting work. New panels shall be included in this scope of work to maintain a uniform result.

1.03 SUBMITTALS

- A. Product Data: Submit manufacturer's standard submittal package including specification, installation instructions, and general information for each waterproofing material.
- B. Applicator Qualifications: Submit a current qualified applicator certificate from the specified waterproofing manufacturer.

1.04 QUALIFICATIONS

- A. Primary coating materials shall be products from a single manufacturer. The primary manufacturer shall recommend any secondary materials. Manufacturer shall have a minimum of 10 years experience in the manufacture of materials of this type.
- B. Applicators shall have a minimum of 5 years experience in the application of damp proofing materials of the type specified. Applicator shall be an authorized applicator from the specified damp proofing manufacturer.
- C. Pre-Installation Conference: Just prior to commencement of the vertical coating system, meet at the site with a representative of the coating manufacturer. The vertical coating contractor, the general contractor and other parties affected by this section. Review methods and procedures, substrate conditions, scheduling and safety.

1.05 DELIVERY, STORAGE AND HANDLING

- A. Store all coating materials in the original unopened containers between 50° - 80°F (10°-26°C) until ready for use.
- B. Follow the special handling or storage requirements of the manufacturer for cold weather, hot weather, etc.
- C. Safety: Refer to all applicable data, including but not limited to, MSDS sheets, PDS sheets, product labels, and specific instructions for specific personal protection requirements.
- D. Ventilation: Provide adequate ventilation to prevent the accumulation of hazardous fumes during application.
- E. Environmental requirements: Proceed with work of this section only when existing and forecasted weather conditions will permit the application to be performed in accordance with the manufacturer's recommendations.

1.06 WARRANTY

- A. The contractor shall guarantee that all work performed will be free from defects in materials and

SECTION 099500 – VERTICAL METAL WALL PANEL RESTORATION (continued):

workmanship. Upon notice of defect in writing, the contractor within one year after completion of work shall, at his own expense, make all necessary repairs or replacements of the defective work in question.

- B. A 7-year, material warranty is available with this system provided it has been installed by a Garland Approved Applicator and is installed according to this specification.

PART 2 – PRODUCTS

2.01 MANUFACTURERS

- A. The design is based upon coating systems engineered and manufactured by The Garland Company or approved equals:

The Garland Company
3800 East 91st Street
Cleveland, Ohio 44105
Telephone: (800) 762-8225
Website: www.garlandco.com

2.02 MATERIALS

- A. Garland: Rust-Go System: Rust-Go Primer is a high-quality, fast drying alkyd primer specifically designed as a rust inhibitive primer or a base primer. Rust-Go Primer strongly adheres to aged coatings and is resistant to yellowing, mild industrial fumes and light chemical conditions, making it ideal for restoration coating systems. Rust-Go VOC Top Coat is a premium industrial maintenance coating that is environmentally friendly and has a unique balance of quality features. Rust-Go VOC Top Coat eliminates the flammability and toxicity hazards associated with solvent based coatings.

- B. Physical Properties:

Rust-Go Primer

Flash Point 40°F (4.4°C) min
Solids by Weight 69.9% ± 2.0%
Solids by Volume 52.5% ± 2.0%
Viscosity @ 77°F (25°C) 70 ± 5 KU
Dry Time @ 77°F (25°C)
To Touch : 30 minutes
Tack Free: 60 minutes
Dry: 24 hours
Color Red
Clean: Xylene or Toluene
Weight/Gallon 12.14 lbs.
Coverage 1/4 gal/100 sq. ft.
VOC < 200 g/l

Rust-Go VOC Top Coat

Flash Point (ASTM D 56): N/A
Non-Volatile (ASTM D 5201): 50%
Solids by Volume (ASTM D 5201): 33%
Viscosity @77°F (25°C) (ASTM D 562): 100 KU
Density: (ASTM D 1475) 11.3 lbs./gal.

SECTION 099500 – VERTICAL METAL WALL PANEL RESTORATION (continued):

Dry Time @ 77°F 50° RH
To Touch : 1 hour
To Recoat : 3-5 hours
Wet Film Thickness @ 1/2 gal. (1.96): 8 mils (203.2 microns)
Clean up: Soapy Water
Coverage 0.5 gal/100 sq. ft. (0.20 l/m²)
(2 coat application required)
VOC 95g/l
Reflectance* .88
Emittance* .87

PART 3 – EXECUTION

3.01 EXAMINATION

- A. Verify that substrate is ready to receive work; surface is clean, dry and free from projections and depressions, loose scale, sand, curing compounds, grease, oil, asphalt, loose coatings need removed and other foreign deposits.
- B. If Applicable, do not begin work until concrete substrate has cured 28 days, minimum. Water cured treatment of concrete is preferred. Resin or water based curing compound should not be used. Non-compatible curing agents must be removed prior to application.
- C. The work shall not be started when temperature is under 40°F (10°C) or when precipitation is imminent.
- D. Verify that all other work involved with this area, done under other sections, has been completed and accepted by the architect and general contractor prior to starting the application.
- E. Damaged areas of metal panels should be repaired prior to coating.

3.02 APPLICATION (Primer)

- A. All surfaces must be sound, dry, clean and free of oil, dirt, grease, wax, mildew, loose or flaking paint and rust. Clean the surface by scraping, sanding, wire brush or blasting. Wearing protective clothing, gloves and glasses, remove any mildew, by washing with a solution of three quarts of warm water and TSP or Simple Green solution. Rinse thoroughly. Dull all hard or glossy surfaces by sanding to assure maximum adhesion. Wipe galvanized surfaces clean with denatured alcohol prior to application.
- B. Check adhesion of old paint using ASTM 3359, measuring adhesion by Tape Method A.
- C. Apply Rust-Go Primer over a small area at 4 wet mils or 1/4 gal/100 sq. ft. (0.10 l/m²) and let set for 20 minutes. Monitor to ensure adhesion and note if sag occurs. If any sag occurs, adjust coverage as necessary. Otherwise, proceed with application.
- D. Do not apply when temperatures are below 40°F (4.4°C) or rain is in the forecast.
- E. Recommended Equipment: Listed below are general equipment guidelines for the application of this product. Job site conditions may require modifications to these guidelines to achieve the desired results.
 - 1. Brush & Roller (General) - Avoid excessive re-brushing or re-rolling. Apply with synthetic brush or roller of appropriate size and/or nap for the surface being

SECTION 099500 – VERTICAL METAL WALL PANEL RESTORATION (continued):

2. painted.
Spray Equipment - See Spray Application Guide (below) for pump requirements and application tips.

3.03 APPLICATION (Top Coat)

- A. Apply Rust-Go VOC Top Coat over a small area at recommended coverage rate and let set for twenty (20) minutes. Monitor Rust-Go VOC Top Coat to ensure adhesion and note if sag occurs. If any sag occurs, adjust coverage as necessary.
- B. Check adhesion of old paint using ASTM 3359, measuring adhesion by Tape Method A.
- C. All surfaces must be sound, dry, clean and free of oil, dirt, grease, wax, mildew, loose or flaking paint and rust by scraping, sanding or wire brush or blasting.
- D. Remove any mildew, wearing protective clothing, gloves and glasses: by washing with a solution of three quarts of warm water, and TSP or Simple Green solution. Rinse thoroughly.
- E. Dull all hard or glossy surfaces by sanding to assure maximum adhesion. Wipe galvanized surfaces clean with mineral spirits prior to application.
- F. Do not apply when temperatures are below 40° F (8°C) or rain is in the forecast.
- G. Once adhesion has been confirmed apply Rust-Go VOC Top Coat at .5 gal./100 ft² (0.21 l/m²) (2 coat application required) over the primed surface.
- H. Safety:
 1. It is good practice to wear chemical splash goggles to avoid contact with eyes. Avoid prolonged contact with skin. Wash thoroughly after handling.
 2. See Material Safety Data Sheet for additional safety information and specific product analysis.
- I. Recommended Equipment: Listed below are general equipment guidelines for the application of this product. Job site conditions may require modifications to these guidelines to achieve the desired results.
 - 1) Brush & Roller (General) - Multiple coats may be required to achieve desired appearance, hiding and for recommended dry film thickness. Avoid excessive re-brushing or re-rolling.
 - 2) Apply with synthetic brush or roller of appropriate size and/ or nap for the surface being painted.
 - 3) Spraying:
 - a. Spray Equipment
 - 1) Airless spray equipment generates very high fluid pressure. Spray equipment must be properly maintained and operated. Any misuse of spray equipment or accessories (such as over-pressurizing, modified parts, or worn or damaged parts) can result in serious bodily injury, fire, explosion, or property damage. Read and follow the equipment manufacturer's instructions and recommendations.
 - 2) Airless spray pump must have minimum 2,500 psi output pressure rating and adequate delivery volume to support the

SECTION 099500 – VERTICAL METAL WALL PANEL RESTORATION (continued):

spray tip orifice gallons per minute rating. High-pressure airless sprayers with a higher maximum pressure capability will allow spray application in cold weather or using spray hose lengths greater than 200 feet (60.96 meters).

- b. Spray Pump Recommendations:
- 1) Pump Ratio 30:1
 - 2) Hose 1/2" ID Hose first 100' (30.48m) w/ swivel connections and 3/8" ID Hose for second 100' (30.48m)
 - 3) Pressure 2,500 psi
 - 4) Working pressure is 1,600 to 2,000 at the gun. Depending on equipment setup, you may be able to spray the coating as low as 1,600 psi. Based on tip size, raise pressure to remove fingers in spray pattern.
 - 5) High pressure fittings
 - 6) Input flow 100 psi
 - 7) Tip = .015 - .019 for a 8" pattern at 12" distance (20.32cm pattern 30.48cm distance)
 - 8) Recommended 12" extension w/ swivel tip.
 - 9) Tip and pump sizes will change depending on temperature and pattern concerns.
 - 10) 1. Hold the spray gun perpendicular to the surface at a distance of 18 to 24 inches (46 to 62 centimeters) from the roof.
- c. While triggering the spray gun, move it at a rate to produce the desired coating wet mil thickness without thin spots or "holidays." Spray technique should include a "half lap" technique where each spray pass is overlapped 50% for uniform coverage. Check applied film thickness using a wet mil gauge.
- d. Using the 1,600-2,000 psi fluid pressure will provide a uniform spray pattern without fingering.
- e. Allow a minimum of 5 hours cure time between coats for cure and solvent evaporation.

3.04 FIELD QUALITY CONTROL

- A. The contractor for work under this section shall maintain a quality control program specifically to verify compliance with this specification. A daily log shall be kept to record actions in the field.
- B. Inspections: Inspections will be performed 3 days per week, by an approved manufacturer's representative, will be required on all projects requiring a warranty.

END OF SECTION 099500

SECTION 101900 - CUBICLE CURTAIN AND TRACK

PART 1 - GENERAL

1.01 RELATED DOCUMENTS:

- A. Drawings and general provisions of Contract, including General and Supplementary Conditions and Division-1 Specification sections, apply to work of this section.

1.02 DESCRIPTION OF WORK:

- A. Curtain Tracks: Surface mounted ceiling tracks at patient rooms and where indicated in the drawings.
- B. Curtains: Curtains shall be fire retardant fabric with open mesh at top complying with NFPA 13. Each curtain shall have a permanent label attached to edge with cleaning instructions.

1.03 QUALITY ASSURANCE:

- A. Provide curtain tracks which are complete assemblies produced by one manufacturer for each type required, including hardware, accessory items, mounting brackets, and fastenings.
- B. Provide materials in colors as selected by Architect from manufacturer's standard colors/patterns.

1.04 SUBMITTALS:

- A. Product Data: Submit manufacturer's specifications and installation instructions for each type of curtain track required. Include methods of installation for each type of supporting structure.
- B. Shop Drawings: Submit shop drawings for special components and application conditions of special units which are not fully dimensioned or detailed in manufacturer's product data. Show relationships to adjoining work.
- C. Samples: For initial selection of colors, submit manufacturer's color charts consisting of sections of exposed components with integral or applied finishes showing full range of colors, materials, etc. available for each type of assembly required.

PART 2 - PRODUCTS:

2.01 CUBICLE TRACKS:

- A. Tracks shall be as made by Imperial Fastener Company. Equal tracks by other manufacturers approved equal will be acceptable.
- B. Components: all tracks shall be complete with all incidentals required for a complete job. Include end stops, coupling plates, and carriers.
- C. Provide mounting fasteners and all supports.
- D. Size of track - to completely cover area, as required. Verify all dimensions.
- E. Type & Finish: IFC-98 Track with IFC-100 slide carriers. Metal parts - satin anodized.
- F. Installation Brackets: Manufacturer's standard brackets designed to facilitate removal of head channels. Provide intermediate brackets at spacing recommended by track manufacturer. Include

SECTION 101900 - CUBICLE CURTAIN AND TRACK (continued):

hardware necessary for secure attachment of tracks adjoining construction. Design brackets to support safely the weight of curtain assemblies plus forces applied to operate.

2.02 CUBICLE CURTAIN:

- A. Manufacturer: Arc Com
- B. Pattern: Canyon-X
- C. Color: To be selected.
- D. Repeat: Approximately 27" V.
- E. Fabric Contents: 97% FG Polyester; 3% X-static silver antimicrobial fiber.
- F. Width: 72" - fabrics are to be installed railroaded.
- G. Test Results: Passes NFPA 701, large and small scale.
- H. Lightfastness: Exceeds AATCC, Method 16 exceeds 60 hours; Class 5.
- I. Care: Washable to 160 degrees. **Do not mix dye lots in a single given space.**

2.03 FABRICATION AND OPERATION:

- A. Prior to fabrication, verify actual dimensions by accurate site measurements. Adjust dimensions for proper fit. Cooperate with other trades for securing tracks to substrates and other finished surfaces.
- B. Fabricate treatment components from non-corrosive, non-staining, non-fading materials which are completely compatible with each other, and which do not require lubrication during normal expected life.

PART 3 - EXECUTION

3.01 INSTALLATION:

- A. Install tracks where indicated, in manner indicated to comply with manufacturer's instructions. Position units level, plumb, secure, at proper height and location relative to other related work. Securely anchor units with proper clips, brackets, anchorages, suited to type of mounting indicated.
- D. Isolate metal parts from concrete and mortar to prevent galvanic action. Use tape or thick coating or other means recommended by manufacturer to effect separation.

3.02 EXISTING WORK:

Repair damage to existing construction caused by reasons of the work in this contract. Do all new work called for in existing building.

END OF SECTION 101900

SECTION 102113 - TOILET PARTITIONS

PART 1 - GENERAL

- 1.01 SUBMITTALS: Submit manufacturer's data and installation instructions, shop drawings showing layout toilet partitions and samples of solid plastic for color selection.
- 1.02 PERFORMANCE REQUIREMENTS:
- A. Fire Resistance: Partition materials shall comply with the following requirements, when tested in accordance with the ASTM E 84: Standard Test Method for Surface Burning Characteristics of Building Materials:
 - 1. Smoke Developed Index: Not to exceed 450
 - 2. Flame Spread Index: Not to exceed 75
 - 3. Material Fire Ratings:
 - a. National Fire Protection Association (NFPA): Class B
 - b. International Code Council (ICC): Class B
- 1.03 QUALITY ASSURANCE
- A. Manufacturer's Qualifications: A company regularly engaged in manufacture of products specified in this section, and whose products have been in satisfactory use under similar service conditions for not less than 5 years.
 - B. Installer's Qualifications: A Company or Individual, regularly engaged in installation of products specified in this Section, with a minimum of 5 years experience.
- 1.04 WARRANTY: Scranton Products (Santana/Comtec/Capitol), guarantees its plastic against breakage, corrosion, and delamination under normal conditions for 25 years from the date of receipt by the customer. If materials are found to be defective during that period for reasons listed above, the materials will be replaced free of charge. (Labor not included in warranty.)

PART 2 - PRODUCTS

- 2.01 MANUFACTURER: Provide toilet partitions as manufactured by Scranton Products (Santana) OR approved equal. Graffiti resistant type.
- 2.02 MATERIAL: Doors, panels and pilasters shall be 1" thick constructed from High Density Polyethylene (HDPE) resins. Partitions shall be fabricated from polymer resins compounded under high pressure, forming a single component which is waterproof, nonabsorbent and has a self-lubricating surface that resists marks from pens, pencils, markers and other writing instruments. All plastic components shall be covered with a protective plastic masking.
- 2.03 CONSTRUCTION:
- A. Doors, panels, and pilasters shall be 1" thick, seamless construction with eased edges.
 - B. Doors and dividing panels shall be 55" high and mounted at 14" above the finished floor. An aluminum heat sink may be fastened to the bottom edges.
 - C. PILASTER: Pilaster shall be 82 inches high and mounted to panels and walls with continuous wall brackets. Pilasters shall contain 2 level adjusting bolts on the bottom and shall be fastened to the floor with a 3 inch high 20 gauge stainless steel shoe anchored as per manufacturer's recommendation. Pilasters shall be overhead braced with anti-grip heavy extruded aluminum (6463 T5 alloy) with bright dip anodized finish headrail.

SECTION 102113 - TOILET PARTITIONS (continued):

- D. WALL BRACKETS: Shall be 54 inches long and made of heavy aluminum extrusion (6463-T5 alloy) with bright dip anodized finish. Wall brackets shall be pre-drilled by manufacturer with holes spaced every 10 inches along full length of brackets. Attachments shall be made as per manufacturer's recommendations. Provide continuous shim, matching toilet partitions, as necessary above tile wainscott.
 - E. Headrail shall be made of heavy-duty extruded aluminum (6463-T5 alloy) with anti-grip design and integrated curtain track. The headrail shall have a clear anodized finish and shall be fastened to the headrail bracket by a stainless steel tamper resistant torx head sex bolt, and fastened at the top of the pilaster with stainless steel tamper resistant torx head screws.
 - F. Headrail brackets shall be 20 gauge stainless steel with a satin finish and secured to the wall with a stainless steel tamper resistant torx head screws.
- 2.04 HARDWARE AND ACCESSORIES: Manufacturer's standard, heavy-duty operating hardware and accessories, non-ferrous cast alloy with satin chrome finish. Furnish for each door, the following:
- A. Hinges: Shall be 8 inches and made of heavy aluminum extrusion (6463-T5 alloy) with bright dip anodized finish with wrap around flanges, surface mounted to the doors with stainless steel tamper resistant torx screws.
 - B. Door strike/keeper shall be 6" long and made of heavy-duty extruded aluminum (6436-T5 alloy) with a bright dip anodized finish and secured to the pilasters with stainless steel tamper resistant torx head sex bolts. Bumper shall be made of extruded black vinyl.
 - C. Latch and housing shall be made of heavy-duty extruded aluminum (6463-T5 alloy). The latch housing shall have a bright dip anodized finish, and the slide bolt and button shall have a black anodized finish.
 - D. Coat Hook and Bumper: Manufacturer's standard unit, rubber-tipped.
 - E. Door Pulls: Manufacturer's standard.
 - F. Door Pulls (Handicapped Stalls): ALL handicapped toilet partition doors to have ADA approved pull handle. Provide cast door pull #137 with US28 finish by Rockwood OR approved equal. Mounting shall be with thru bolt.
 - G. Heat Sinc: Aluminum edging strips shall be fastened to the bottom edge of all doors and panels.
- 2.05 ANCHORAGES AND FASTENERS: Manufacturer's standard theft-proof exposed fasteners, finished to match hardware.
- 2.06 FABRICATION:
- A. Floor-Supported Pilasters: 1" thick, with galvanized steel anchorage complete with threaded rods, lock washers, and leveling nuts.
 - B. Doors and Panels: Not less than 1" thick units, size shown. Doors to meet ADA requirements.

PART 3 - EXECUTION

- 3.01 INSTALLATION: Install partitions rigid, straight, plumb and level in accordance with manufacturer's printed instructions. Set units with not more than 1/2" between pilasters and panels, and not more than 1"

SECTION 102113 - TOILET PARTITIONS (continued):

clearances between panels and walls.

- 3.02 HARDWARE ADJUSTMENTS: Adjust and lubricate hardware for proper operation after installation.
- A. Set hinges on in-swing doors to hold doors open approximately 30 deg from the closed position when unlatched.
- B. Set hinges on out-swing doors to return to fully closed position.
- 3.03 CLEANING AND FINAL ADJUSTMENTS: Perform final adjustments to leveling devices, door hardware, and other operating parts. Clean exposed surfaces and touch up minor finish imperfections using materials and methods recommended by partition manufacturer.
- 3.04 REPLACE DAMAGE units which cannot be satisfactorily field repaired, as directed by Architect.

END OF SECTION 102113

SECTION 102600 – CORNER GUARDS

PART 1 - GENERAL

1.01 SUMMARY

- A. This section includes the following types of wall protection systems:
 - 1. Corner Guards
- B. Related sections: The following sections contain requirements related to this section:
 - 1. Blocking in walls for fasteners; refer to section 092900 – Gypsum Drywall.

1.02 REFERENCES

- A. National codes (IBC, UBC, SBCCI, BOCA and Life Safety)
- B. American Society for Testing and Materials (ASTM)
- C. Underwriters Laboratories (UL)

1.03 SUBMITTALS

- A. General: Submit the following in accordance with conditions of contract and Division 1 specification section 013300 - Submittal.
- B. Product data and detailed specifications for each system component and installation accessory required, including installation methods for each type of substrate.
- C. Shop drawings showing locations, extent and installation details of corner guards. Show methods of attachment to adjoining construction.
- D. Samples for verification purposes: Submit the following samples, as proposed for this work, for verification of guard.
 - 1. 12" (304.8mm) long sample of each model specified.
- E. Product test reports from a qualified independent testing laboratory showing compliance of each component with requirements indicated.
- F. Maintenance data for wall protection system components for inclusion in the operating and maintenance manuals specified in Division 1.

1.04 QUALITY ASSURANCE

- A. Installer qualifications: Engage an installer who has no less than 3 years experience in installation of systems similar in complexity to those required for this project.
- B. Manufacturer's qualifications: Not less than 5 years experience in the production of specified products and a record of successful in-service performance.
- C. Code compliance: Assemblies should conform to all applicable codes including IBC, UBC, SBCCI, BOCA and Life Safety.

SECTION 102600 – CORNER GUARDS (continued):

- D. Fire performance characteristics: Provide wall protection system components with UL label indicating that they are identical to those tested in accordance with ASTM E84 (CAN/ULC S102.2) for Class 1 characteristics listed below:
 - 1. Flame spread: 25 or less
 - 2. Smoke developed: 450 or less
- E. Impact Strength: Provide assembled wall protection units that have been tested in accordance with the applicable provisions of ASTM F476.
- F. Chemical and stain resistance: Provide wall protection system components with chemical and stain resistance in accordance with ASTM D-1308.
- G. Color match: Provide wall protection components that are color matched in accordance with the following:
 - 1. Delta Ecmc of no greater than 1.0 using CIELab color space. (Specifier note: Construction Specialties' colors are matched under cool white fluorescent lighting and computer controlled within manufacturing tolerances. Color may vary if alternate lighting sources are present).
- H. Single source responsibility: Provide all components of the wall protection system manufactured by the same company to ensure compatibility of color, texture and physical properties.

1.05 DELIVERY, STORAGE AND HANDLING

- A. Deliver materials to the project site in unopened original factory packaging clearly labeled to show manufacturer.
- B. Store materials in original, undamaged packaging in a cool, dry place out of direct sunlight and exposure to the elements. A minimum room temperature of 40°F (4°C) and a maximum of 100°F (38°C) should be maintained.
- C. Material must be stored flat.

1.06 PROJECT CONDITIONS

- A. Materials must be acclimated in an environment of 65°-75°F (18°-24°C) for at least 24 hours prior to beginning the installation.
- B. Installation areas must be enclosed and weatherproofed before installation commences.

PART 2 - PRODUCTS

2.01 MANUFACTURERS

- A. Interior surface protection products specified herein and installed on the submittal drawings shall be manufactured by InPro Corporation, Inc. OR approved equal.
 - 1. Contact: Joe Muskus, (904) 403-6755.

SECTION 102600 – CORNER GUARDS (continued):

2.02 MATERIALS

- A. Vinyl/Acrylic: Extruded material should be high impact Acrovyn with shadow grain texture. Chemical and stain resistance should be per ASTM D-1308 standards as established by the manufacturer. Colors to be selected from one of manufacturer's standard color range.

2.03 CORNER GUARDS

- A. Vinyl/Acrylic corner guards to be InPro Corporation. (Administrative/Office Areas).
 - 1. Surface mounted, textured tape on corner guards.
 - 2. Size: 1 ½" x 1 ½" 90° degrees x 9'-0"
 - 3. Color: See Color Legend in drawings.
 - 4. Locations: See Finish Plans (CG).
- B. Surface-Mounted Stainless Steel Corner Guards: (Laboratory Areas)
 - 1. See Section 115360.
 - 2. Locations: See Sheet L102 floor plan for locations.

2.04 FABRICATION

- A. General: Fabricate wall protection systems to comply with requirements indicated for design, dimensions, details, finish and member sizes.

PART 3 - EXECUTION

3.01 EXAMINATION

- A. Verification of conditions: Examine areas and conditions under which work is to be performed and identify conditions detrimental to proper or timely completion.
 - 1. Do not proceed until unsatisfactory conditions have been corrected.
 - 2. Preparation
- B. Surface preparation: Prior to installation, clean substrate to remove dirt, debris and loose particles. Perform additional preparation procedures as required by manufacturer's instructions.
- C. Protection: Take all necessary steps to prevent damage to material during installation as required in manufacturer's installation instructions.

3.02 INSTALLATION

- A. Install the work of this section in strict accordance with the manufacturer's recommendations, using only approved mounting hardware, and locating all components firmly into position, level and plumb.
- B. Temperature at the time of installation must be between 65°-75°F (18°-24°C) and be maintained for at

SECTION 102600 – CORNER GUARDS (continued):

least 48 hours after the installation.

3.03 CLEANING

- A. General: Immediately upon completion of installation, clean vinyl covers and accessories in accordance with manufacturer's recommended cleaning method.
- B. Remove surplus materials, rubbish and debris resulting from installation as work progresses and upon completion of work.

3.04 PROTECTION

- A. Protect installed materials to prevent damage by other trades. Use materials that may be easily removed without leaving residue or permanent stains.

END OF SECTION 102600

SECTION 102800 - TOILET AND BATH ACCESSORIES

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

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

1.02 SUBMITTALS

- A. Product Data: For each type of product included. Include the following:
1. Construction details and dimensions.
 2. Anchoring and mounting requirements, including requirements for cutouts in other work and substrate preparation.
 3. Material and finish descriptions.
 4. Manufacturer's warranty.
- B. Maintenance Data: For toilet and bath accessories to include in maintenance manuals.

- 1.03 STRUCTURAL REQUIREMENTS: All grab bars and their mounting devices shall withstand a downward load of at least 250 lbs. of force when tested according to method in ASTM F 446.

1.04 WARRANTY

- A. Special Mirror Warranty: Manufacturer's standard form in which manufacturer agrees to replace mirrors that develop visible silver spoilage defects and that fail in materials or workmanship within a 5-year period from date of Substantial Completion.

PART 2 - PRODUCTS

- 2.01 MANUFACTURER: Provide toilet and bath accessories as manufactured by Bobrick, Gamco OR approved equal.

- 2.02 GENERAL: Provide toilet and bath accessories as scheduled. Install units at locations and heights as indicated, plumb and level, firmly anchored, in accordance with manufacturer's instructions.

2.03 MATERIALS:

- A. Stainless Steel: AISI Type 302/304, with polished No. 4 finish, 22 gage minimum, unless otherwise indicated.
- B. Mirror Glass: 1/4" thick, Type I, Class 1, Quality q2, conforming to FS DD-G-451, with silvering, copper coating, and protective organic coating complying with FS DD-M-411.
- C. Galvanized Steel Sheet: ASTM A 527, G60.
- D. Galvanized Steel Mounting Devices: ASTM A 153, hot-dip galvanized after fabrication.
- E. Fasteners: Screws, bolts, and other devices of same material as accessory unit or of galvanized steel where concealed.

- 2.04 GENERAL FABRICATION: Stamped names or labels on exposed faces of toilet and bath accessory units are not permitted, however unobtrusive labels indicating manufacturer and model number are required on surface not exposed to view. Wherever locks are required for particular type of accessory, provide same keying throughout project. Furnish two keys for each lock, properly identified.

SECTION 102800 - TOILET AND BATH ACCESSORIES (continued):

- A. Mirror Fabrication: Fabricate frames for glass mirrors to accommodate wood, felt, plastic, or other glass edge protection material. Provide mirror backing and support system which will permit rigid, tamperproof glass installation and prevent accumulation of moisture.
 - B. Surface-Mounted Accessories: Fabricate units with tight seams and joints, exposed edges rolled. Hang doors or access panels with continuous piano hinge or minimum of two 1-1/2" pin hinges of same metal as unit cabinet. Provide concealed anchorage wherever possible.
 - C. Recessed Toilet Accessories, General: Except where otherwise indicated, fabricate units of all welded construction, without mitered corners. Hang doors or access panels with full-length stainless steel piano hinge. Provide anchorage that is fully concealed when unit is closed.
- 2.05 TOILET ACCESSORY ITEMS: Provide the following toilet accessories by Bobrick Washroom Equipment Inc. OR approved equal, unless otherwise noted.
- A. Grab Bars: Provide stainless steel grab bars with wall thickness not less than 18 gage, outside diameter 1-1/2", concealed mounting, with #4 polished satin finish. Refer to Drawings for configurations and size of grab bars. Provide concealed anchors for each flange as per manufacturer's recommendations. *(B-6806-36; B-6806-42; Two Wall Grab Bar B-68616 (24" x 36"))*
 - B. Stainless Steel Framed Mirrors: Fabricate frame with angle shapes of not less than 18 gage (.050"), with square corners mitered to hairline joints and mechanically interlocked; tamper-resistant concealed wall hanger. Provide in No. 4 satin polished finish. *(B-165 1836 18" x 36")*
 - C. Surface Mounted Bulk Roll Toilet Tissue Dispenser: Model 09686, JRT Escort bulk roll dispenser, as manufactured by Kimberly Clark.
 - D. Surface Mounted Soap Dispenser: Model 9034-12 800ml, as manufactured by Gojo Industries, Akron, Ohio.
 - E. Surface Mounted Automatic Hand Dryer: Dryer shall have a one-piece, cast-aluminum cover pretreated with chromate before high-gloss, baked white enamel finish is applied. Cover shall be equipped with vandal-resistant air-outlet nozzle. Graphic operating instructions shall be featured on a vandal-resistant aluminum insert, permanently bonded to the dryer cover, Motor shall be 1/10 h., universal type on resilient mounting with sealed ball bearing at drive-shaft end and self-lubricating sleeve bearing at nondrive end; equipped with automatic thermal-overload switch. Heating element shall be located on inlet side of fan. Electronic sensor shall automatically turn dryer on when hands or self-returning nozzle are held under air-outlet opening and across path of sensor. Dryer shall turn off automatically when hands are removed or self-returning nozzle is released. Sensor shall automatically shut dryer off approximately 1½" minutes after dryer turns on if an inanimate object is placed across air-outlet opening. *(B-750 115V) (B-750 208-240V)*
 - F. Surface Mounted Napkin Disposal: Construct of Type 304 stainless steel. Exposed surfaces shall have satin finish. Self-closing door shall be secured to cabinet with full length, stainless steel piano hinge and equipped with a tumbler lock. Unit shall have a self-closing panel covering disposal opening. Panel shall be secured to door with a spring-loaded, full-length stainless steel piano-hinge. Unit shall be furnished with a removable, leak-proof molded polyethylene receptacle with a capacity of 1.2 gal. *(B-254)*
 - G. Shower Curtain Hooks: Hooks to be Type 304 stainless steel for use on the specified shower curtain rod. *(B-204-1)*

SECTION 102800 - TOILET AND BATH ACCESSORIES (continued):

- H. Vinyl Shower Curtain: Shower curtain shall be opaque, matte white vinyl .008" thick, containing antibacterial and flame-retardant agents, and shall have nickel-plated brass grommets along top. Bottom and sides shall be hemmed. *(B-204-2 (42"w))*
- Mop and Broom Holder/Utility Shelf: Combination unit with 18-gage (.050") Type 304 stainless steel shelf with 1/2" returns, 16-gage (.062") support brackets for wall mounting, provide 16-gage stainless steel hooks for wiping rags on front of shelf, together with spring-loaded rubber cam type mop/broom holders; 1/4" diameter stainless steel drying rod suspended beneath shelf. Provide 34" long unit with 3 mop/broom holders and 4 hooks. *(B-239 x 34)*
- I. Hook and Door Stop: Coat hook shall be constructed of solid aluminum with satin finish. Unit shall be equipped with hard rubber bumper. *(B-212)*
- J. Towel Bar: "square towel bar x 24" long, projecting 3c" from the wall and being bright polished stainless steel. *(7673-24)*
- K. Stainless Steel Shelf: Shelf shall be constructed entirely of Type 304, 18 gauge stainless steel with satin finish. Mounting brackets, welded to shelf shall be 16 gauge stainless steel. Shelf shall be 8" wide with 3/4" return edges. Length of shelf shall be 24" unless otherwise noted on drawings. *(B-298 x 24)*

PART 3 - EXECUTION

3.01 INSTALLATION:

- A. Install toilet accessory units in accordance with manufacturer's instructions, using fasteners appropriate to substrate and recommended by manufacturer of unit. Install units plumb and level, firmly anchored in locations indicated and in accordance with the requirements of ADA.

3.02 ADJUSTING AND CLEANING

- A. Adjust accessories for unencumbered, smooth operation. Replace damaged or defective items.
- B. Remove temporary labels and protection coatings.
- C. Clean and polish exposed surfaces according to manufacturer's written recommendations.

END OF SECTION 102800

SECTION 104416 - FIRE EXTINGUISHERS, CABINETS, AND ACCESSORIES

PART 1 - GENERAL

- 1.01 UL-Listed Products: Provide new UL-listed fire extinguishers bearing UL "Listing Mark" for type, rating, and classification of extinguishers indicated.
- 1.02 Submittals: Submit product data and finish samples.

PART 2 - PRODUCTS

- 2.01 Manufacturers: Subject to compliance with requirements, provide products by one of the following:

Allenco	Modern Metal Products by Muckle
Ansul Fire Protection, Wormald US Inc.	Potter-Roemer, Inc.
Badger-Powhatan	Samson Metal Products, Inc.
Bobrick Washroom Equipment, Inc.	Walter Kidde, Division of Kidde, Inc.
J.L. Industries	Watrous Inc.
Larsen's Manufacturing Co.	

- 2.02 Fire Extinguishers: Provide fire extinguishers for each extinguisher cabinet and other locations indicated on Life Safety Plans.
- A. Contractor's Option: Contractor has option to provide rated fire extinguisher cabinets in rated walls OR provide 5-sided gypsum board box in rated walls.
- 2.03 Multipurpose Dry Chemical Type:
- A. Typical Areas: UL-rated 3A-20 B: C min., in enameled steel containers.
- B. Labs, Shops, Boiler Rooms, Bulk Storage, Electrical and Equipment Rooms: UL-rated 3A-40 B: C min., in enameled steel containers.
- C. Bulk Paper Storage: UL-rated 4A-60 B:C, in enameled steel containers.
- D. Kitchens: UL-rated 3A-40 B:C min.
- 2.04 Mounting Brackets: Provide brackets for extinguishers not located in cabinets.
- 2.05 Fire Extinguisher Cabinets: Provide fire extinguisher cabinets where indicated, of suitable size for housing fire extinguishers of types and capacities indicated.
- A. Semi-Recessed: Cabinet box (tub) recessed in walls of sufficient depth to suit style of trim indicated.
1. Exposed Trim: One-piece combination trim and perimeter door frame overlapping surrounding wall surface with exposed trim face and wall return at outer edge (backbend).
- a. Rolled Edge Trim with 2-1/2 inch backbend depth.
- b. Trim Metal: Of same metal and finish as door.
- B. Fully-Recessed: Cabinet box recessed in walls of sufficient depth to suit style of trim indicated.
1. Exposed Flat Trim: One-piece combination trim and perimeter door frame overlapping surrounding wall surface with exposed trim face and wall return at outer edge (backbend) of 1/4 to 5/16 inch.

SECTION 104416 - FIRE EXTINGUISHERS AND ACCESSORIES (continued):

- C. Surface Mounted: Cabinet box fully exposed and mounted directly on wall; with no trim.
- 2.06 Door Material and Construction: Manufacturer's standard door construction, of material indicated, coordinated with cabinet types and trim styles selected.
 - A. Enameled Steel: Manufacturer's standard finish, hollow steel door construction with tubular stiles and rails.
 - B. Identify fire extinguisher in cabinet with lettering spelling "FIRE EXTINGUISHER" applied by silkscreen method to door. Provide lettering to comply with requirements indicated for letter style, color, size, spacing, and location or as selected by Architect from manufacturer's standard arrangements. Lettering shall be vertical and red. Cabinet shall be white.
 - C. Door Style: Manufacturer's standard full flush solid panel of material indicated.
 - D. Door Hardware: Provide manufacturer's standard door-operating hardware of proper type for cabinet type, trim style, and door material and style indicated. Provide either lever handle with cam action latch, or door pull, exposed or concealed, and friction latch. Provide concealed or continuous-type hinge permitting door to open 180 deg.
- 2.07 Factory Finishing of Fire Extinguisher Cabinet: Comply with NAAMM "Metal Finishes Manual" to provide uniformly finished products. Protect mechanical finishes on exposed surfaces from damage by application of strippable, temporary protective covering prior to shipment. Cabinet shall be mounted 48" A.F.F. to center of cabinet handle.
- 2.08 Fire Blanket and Cabinet: Provide fire blanket and surface mounted cabinet "FB 1016" by Larsen's Manufacturing Company OR approved equal. Each cabinet shall be constructed of cold-rolled steel with a red baked acrylic enamel finish. Each cabinet shall have a 62" x 80" fire blanket made of a rugged blend of reprocessed wool. Cabinet shall be mounted 48" A.F.F. to center of cabinet handle.

PART 3 - EXECUTION

- 3.01 Installation:
 - A. Install items included in this section in locations and at mounting heights indicated, or if not indicated, at heights to comply with applicable regulations of governing authorities.
 - B. Prepare recesses in walls for fire extinguisher cabinets as required by type and size of cabinet and style of trim and to comply with manufacturer's instructions.
 - C. Securely fasten mounting brackets and fire extinguisher cabinets to structure, square and plumb, to comply with manufacturer's instructions.

END OF SECTION 104416

SECTION 109900 - MISCELLANEOUS SPECIALTIES

PART 1 - GENERAL

- 1.01 Description: This section includes the following items:
Flame Resistance Exterior Fabric Awning and Framework
- 1.02 Submittals: Product data for each type of accessory specified, with installation instructions for each unit built-in or connected to other construction.
- 1.03 Shop Drawings: Provide shop drawings showing installation details of accessories permanently affixed to construction, including full scale installation details of special conditions. Provide signed and sealed by a registered Florida engineer, awning fabrication drawings and calculations
- 1.04 Delivery, Storage and Handling: Deliver materials to project site in original factory wrappings and containers, clearly labeled with identification of manufacturer, brand name, and lot number. Store materials in original undamaged packages and containers, inside well-ventilated area protected from weather, moisture, soiling, extreme temperatures, humidity; laid flat, blocked off ground to prevent sagging and warping.
- 1.05 Sequence and Scheduling: Sequence accessory installation with other work to minimize possibility of damage and soiling during remainder of construction period.

PART 2 - PRODUCTS

- 2.01 Flame Resistance Exterior Fabric Awning and Framework: Provide a flame resistance exterior fabric awning, and 1" square aluminum tube framework fabricated by Capital Awning Company, 1510 Capital Circle, Suite 2, Tallahassee, FL 32301. Contact: Chris Siegle at (850)878-5383 or (850)508-4272.
- A. Awning to be a standard shed and curved style. Color to be selected by Architect.
- B. Awning contractor to provide design calculations for necessary wind requirements, signed and sealed by a registered Florida engineer.

PART 3 - EXECUTION

- 3.01 Installation: Verify that materials are those specified before installing. Install accessories after other finishing operations have been completed and as indicated from manufacturer's instructions and recommendations.

END OF SECTION 109900

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I.) Guarantees:

This guarantee includes:

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- **Permanent flame retardancy**
- **Total waterproofness**
- **Maintenance of the flexibility: under normal conditions of exposure to bad weather and normal conditions of handling, we guarantee against the loss of weight by deplastification of not more than 10%.**
- **Any important change of color in the mass, within a made-up surface. This change must be uniform through the whole fabric width as a component of a made-up panel.**

II) Exclusion

- Defects due to the design, the making-up and the use and handling of made-up covers or structures, especially accelerated weathering due to water retention in the roof cover.
- Accidents occurring during the handling (wear and tear, friction, scratches, perforations).
- Degradation due to aggressive cleaning resulting from either the cleaning process itself or the use of aggressive detergents, abrasives or solvents.
- External chemical attacks: high atmospheric pollution, aggressive detergents or detergent migration.
- Formation of localized spots which do not generate a large and uniform change of color through the whole panel width. Abnormal or excessive discoloration from atmospheric pollution or other debris.

III) Conditions of Guarantee Application

- Declaration by registered letter with acknowledgement of receipt within 30 days maximum after defect appearance.
- Date of beginning of the guarantee: delivery date of the fabric to the fabricator
- Guarantee application:
 - + According to the guarantees stated in paragraph I and under the restriction conditions stated in paragraph II, we only cover: the replacement cost of the fabric.

• Graduation:

- 1st year: reimbursement of 100% of the above mentioned charges
- 2nd year: reimbursement of 80% of the above mentioned charges
- 3rd year: reimbursement of 64% of the above mentioned charges
- 4th year: reimbursement of 51% of the above mentioned charges
- 5th year: reimbursement of 41% of the above mentioned charges
- 6th year: reimbursement of 33% of the above mentioned charges
- 7th year: reimbursement of 26% of the above mentioned charges
- 8th year: reimbursement of 20% of the above mentioned charges

SERGE FERRARI NORTH AMERICA INC

EIGHT YEAR LIMITED WARRANTY

STATIC and FIXED FRAME PERMANENT AWNING and CANOPY ONLY

Subject to all the terms and conditions contained herein and with specific reference to the percentage of Serge Ferrari Liability chart contained herein, SERGE FERRARI NORTH AMERICA INC, through Tissage et Enduction Serge FERRARI S.A. ("Ferrari") hereby provides a eight (8) year limited warranty for the Ferrari architectural fabrics in Static and Fixed Frame Permanent Awnings and Canopy only: **PRECONTRAIINT 502, PRECONTRAIINT 502 STRIPES, and PRECONTRAIINT 542** (specification sheets here enclosed).

A) COMPLIANCE WITH SPECIFICATIONS

Ferrari warrants that the products shall at the time of delivery at Ferrari's plant of manufacture, meet all technical specifications stated in the published Ferrari data sheet.

B) TENSILE STRENGTH

Ferrari warrants that the products shall retain at least 70% of their tensile strength for a period of eight (8) years following delivery of the Products from SERGE FERRARI NORTH AMERICA INC or their authorized distributor and providing that the membrane has been designed and installed with an initial safety coefficient of minimum five (5). The proof of maintenance will need to be recorded and made available upon request at any time.

Tensile strength measurements will be performed in plain fabric panels, which exclude areas where the membranes could have been cut or damaged during installation phases or areas where the fabric has not been under permanent tension (wind flapping...).

C) FLAME RETARDENCY AND WATERPROOFING

Ferrari warrants that the products shall remain flame retardant and waterproof for a period of eight (8) years following the delivery of the Products from SERGE FERRARI NORTH AMERICA INC and/or authorized North American distributors.

D) COLOR LIGHT FASTNESS

While all color pigments do fade eventually, Ferrari warrants that when fabricated, installed and maintained according to instructions and when placed in normal atmospheric conditions, it will not fade excessively or undergo excessive color degradation to the extent that the awning becomes ineffective for its intended purpose when viewed at a normal distance.

Each of the above described warranties are herein described collectively as the "Limited Warranty".

FERRARI'S OBLIGATIONS UNDER LIMITED WARRANTY: Ferrari agrees to provide, to the extent and for the time period stated in the chart below a percentage of the cost to repair or replace at Ferrari's sole option, the products which may prove defective or otherwise fail to perform as stated above under normal use, maintenance and service, as determined by Ferrari during the warranty period (a "Defect" or "Defective Product"), not to exceed the original sales price to the original purchaser of the Product. The customer must pay the remaining portion of any such costs of repair or replacements of a Defective Products:

Percentage of Ferrari Liability

Defect Occurring In	Percentage of Cost Assumed by Ferrari	Defect Occurring In	Percentage of Cost Assumed by Ferrari
1st Year	100%	5th Year	41%
2nd Year	80%	6th Year	33%
3rd Year	64%	7th Year	26%
4th Year	51%	8th Year	20%

Certificate of Flame Resistance



Registered Fabric
or Concern Number

F-44401

Issued By:

SERGE FERRARI NORTH AMERICA
1460 SW 6TH COURT



POMPANO BEACH, FL 33069

Date treated or manufactured:

01/16/2014

This is to certify that the materials described below have been treated with a flame-retardant chemical or are inherently nonflammable.

FOR: Trivantage, LLC

ADDRESS: 1831 North Park Ave.

CITY: Glen Raven

STATE: NC 27217

Certification is hereby made that: (Check "a" or "b")

- (a) The articles described at the bottom of this Certificate have been treated with a flame-retardant chemical approved and registered by the State Fire Marshal and the application of said chemical was done in conformance with the laws of the State of California and the Rules and Regulations of the State Fire Marshal.

Name of chemical used: _____ Chemical Registration #: _____

Method of application: _____

- (b) The articles described at the bottom of this Certificate are made from a flame-resistant fabric or material registered and approved by the State Fire Marshal for such use.

Trade Name of flame-resistant fabric or material used: PRECONSTRAINT 502 Registration #: F-44401

The Flame-Retardant Process Used Will Not Be Removed By Washing

LUDOVIC ROLLIN

QUALITY MANAGER

Name of Applicator or Production Superintendent

Title

RCN # 0000000001007740555

CUSTOMER ORDER NO. chris

CUSTOMER INVOICE NO. 374651

YARDS OR QUANTITY 16.00

DESCRIPTION Serge Ferrari Preconstraint 502 #2161 70.8" Blue (Standard Pack 54 Yards)

ITEM NUMBER 878976

We hereby certify the above to accurately reflect the information contained within a "CERTIFICATE OF FLAME RESISTANCE" issued to Trivantage, LLC from the registrant set forth above. A copy of the original Certificate of Flame Resistance is available upon request to Trivantage, LLC and the registration information set forth above is on record with the California State Fire Marshal.

MAILING ADDRESS

CAPITAL AWNING CO
1510 CAPITAL CIR SE # 2

TAI LAHASSFF FI 32301-5146

SECTION 110000 - EQUIPMENT

Refer to the information concerning items that the Owner is furnishing and the Contractor is responsible for installing shown on Sheet L-100.

The Contractor shall fill all voids and seal all openings between built-in equipment and adjacent surfaces.

See plans for Equipment Legend on Sheet L-100 and as defined in this Section.

Designations for responsibility of equipment furnishing and installing.

- OFOI Owner furnished, Owner installed.
- CFCI Contractor furnished, Contractor installed.
- OFCI Owner furnished, Contractor installed.
- OFVI Owner furnished, Vendor installed.

Notes:

1. Contractor to prep room for installation by vendor, coordinate delivery/schedule, utilities and final connections/room prep.
2. Contractor to coordinate refrigerator with automatic ice maker hook-ups (if applicable).
3. Contractor to coordinate blocking for all wall mounted and support for ceiling hung devices.

END OF SECTION 110000

SECTION 11 53 00 - LABORATORY EQUIPMENT

PART 1 - GENERAL

1.1 DESCRIPTION

- A. Furnish and install all laboratory equipment as shown and specified. Divisions 23 and 26 shall be responsible for final connections of fixtures and accessories specified herein.
- B. Equipment items specified in this Section include the following:

<u>Contractor Furnished Contractor Installed (CFCI)</u>	<i>*Equipment Number</i>
Safety Supply Cabinet	SSC
First Aid Kit	Inside SSC
Burn Kit	Inside SSC
Evidence Drying Cabinet 32" (Add Alternate)	DCI
Bug Zapper	BZ
 <u>Owner Furnished Owner Installed (OFOI)</u>	
Laboratory Refrigeration Units	RIA
Laboratory Freezer Units	FIA
Laboratory Spill Cart	SC
Laboratory Paper Towel Dispenser	PTD
 Specified in Division 26:	
Overhead Cord Reel – Recessed (Power)	OHCR-1
Overhead Cord Reel – Recessed (Data)	OHCR-2

- C. Refer to Divisions 22, 23 and 26 and the mechanical and electrical drawings for related plumbing, mechanical and electrical work.
- D. Equipment item locations are indicated in the lab plans by means of equipment numbers. The corresponding equipment number for each specified equipment item is also included in this specification.

1.2 RELATED DOCUMENTS: The completion of the work described in this Section may require work in or coordination with other Sections of these specifications. The Contractor and the subcontractor will be responsible for identifying and including all related work in other Sections of these specifications and/or drawings necessary for a complete installation of the work described in this Section. These related Sections include, but are not limited to the following:

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specifications, apply to this Section.
- B. Division 12 35 53: Laboratory Casework, Fixtures and Accessories.
- C. Division 6 & 9: Blocking and backing in walls for anchorage of equipment.
- D. Refer to Divisions 22, 23 and 26 and the mechanical and electrical drawings for related plumbing, mechanical and electrical work.

1.3 QUALIFICATIONS

- A. Manufacturer: Company specializing in manufacturing the Products specified in this Section with a minimum of five years' documented experience.

1.4 SUBMITTALS

- A. Submit under provisions Division I, General Requirements.
- B. Product Data: Provide manufacturer's technical data, including equipment dimensions and construction, equipment capacities, physical dimensions, utility and service requirements and locations, point loads and factory finishes.
- C. Manufacturer's Installation Instructions: Indicate special installation requirements.
- D. Shop Drawings: Indicate equipment locations, large-scale plans, elevations, cross Sections, details, plumbing and electrical rough-in and anchor placement dimensions and tolerances and clearances required.
- E. Coordination Drawings: Equipment shall be fully coordinated with lab casework and other lab equipment. Prepare a coordination drawing showing locations of surrounding casework and equipment and required clearances between them.

1.5 FIELD MEASUREMENTS

- A. Verify that field measurements are as indicated on shop drawings or as instructed by the manufacturer.

1.6 QUALITY ASSURANCE

- A. Installers: Installation of the equipment specified under this Section shall be undertaken by the manufacturer's crew of installers, or a crew of installers who are approved in writing by the manufacturer. In either case, the installation of equipment specified under this Section shall remain the responsibility of the manufacturer as a subcontractor to the General Contractor.

1.7 CLOSEOUT SUBMITTALS: OPERATION AND MAINTENANCE DATA

- A. Submit information in bound manual form, typed or computer word processed on 8-1/2"x11" paper.
- B. Operation Data: Include description of equipment operation, adjustments and testing required.
- C. Maintenance Data: Identify system maintenance requirements, servicing cycles and spare part sources.

1.8 DELIVERY, STORAGE AND HANDLING

- A. Deliver, store, protect and handle products in such a manner as to minimize the risk of damage, decay, deterioration or loss from theft.
- B. All products shall be delivered to the job site in manufacturer's original unopened containers, crates or protective wrappings with the manufacturer's name and address clearly labeled thereon.

- C. Accept products on site and inspect on arrival for damage.

1.9 WARRANTY

- A. Provide warranty under provisions of Division 1.

PART 2 - PRODUCTS

2.1 ACCEPTABLE PRODUCTS

- A. Subject to compliance with these specifications, acceptable products include, but are not limited to, those items indicated in Section 2.2, under each individual product. Products by other manufacturers submitted as equals will be reviewed for conformance with the specifications.

2.2 LABORATORY EQUIPMENT

A. General Requirements

1. All material and equipment specified under this Section shall be designed and constructed specifically for use in wet chemistry, serological and/or toxicological laboratory environments. Manufactured equipment units must meet or exceed applicable performance, reference and certification standards.
2. Dimensions, capacities and specific requirements are nominal, and may vary depending on the manufacturer.

- B. Laboratory Refrigeration Units (See Table below for Equipment Number): Laboratory refrigerators, freezers and combination refrigerator / freezer models numbers noted below are all to be manual-defrost with the IntrLogic Microprocessor Control System based on Thermo Fisher Scientific models as manufactured by Revco Laboratory Products, Ashville, NC, 800-252-7100, 828-365-1254, trace.bates@thermofisher.com, or equivalent products by Puffer Hubbard Jewett.

NOTE: Item is OFOI and specification is provided for Owner's Benefit

1. Cabinet Construction: Foamed-in-place, CFC-free urethane insulation with acrylic-coated steel housing and lining. All materials and construction shall be designed to meet UL, NFPA and OSHA criteria for safety, performance and certification for laboratory use.
2. All units shall be provided as locking w/ keys. Locks shall be 5 pin locking system, heavy-duty cylinder type. Master key to Owner's requirements.
3. Refrigeration System: Heavy-duty industrial hermetically sealed and insulated compressor. Positive, forced-air circulation system designed to maintain uniform cabinet temperature throughout. Operating temperature shall be adjustable between temperatures scheduled below.
4. Capacity: As listed in manufacturer's literature for each refrigerator noted below. Provide refrigerators with stainless steel wire shelves suitable for general laboratory storage.
5. Electrical: 115 VAC, 60Hz plug-in cord, minimum 8' long. All connections shall comply with the local electrical code.
6. Remote monitoring: Provide units noted below with a dry contact capable of typing into the building management system (BMS). Monitor temperature in range only, with adjustable high/low limit closing when limit is exceeded. Historical tracking is not required. Additionally, provide each unit noted below with a 6038 access port for insertion of Owner provided probe.

7. Refrigerator / Freezer Schedule:

Equip. Number	Type Exterior Dimensions In inches	Model Number	Size Cubic Feet	Dry contact to tie to remote BMS	Access port (in addition to the dry contact)	Operating Range °C
RIA	Lab Refrigerator (Critical Storage)	Thermo Fisher Scientific / REL2304A	23	Yes	Yes	+4°C
F1A	Lab Freezer (Critical Storage) Manual Defrost	Thermo Fisher Scientific / Revco ULT2330A	23	Yes	Yes	-30°C

C. Safety Supply Cabinet (Equipment Number SSC):

1. Basis of Design: Acudor. Products of Karp or Best Access Doors are acceptable, provided they comply with features listed below, will be considered acceptable.
2. Model: Customized version of ARVB Recessed Valve Box
3. Features:
 - a. Size: Inside box dimensions: 12"W x 18"H x 4"D
 - b. Style: Fully recessed, with overlapping trim, door flush with trim, one adjustable shelf.
 - c. Single flat door:
 - 1) Door material: Solid panel, 18 gauge stainless steel, #4 satin finish.
 - 2) Door Handle: Flush mounted paddle handle, finished to match door.
 - 3) Hinge: Concealed piano hinge, heavy duty stainless steel.
 - d. Trim:
 - 1) Material and Finish: Same as door, arc welded and ground smooth.
 - e. Signage: Provide self-adhesive signage in compliance with ANSI Z-535 on each door with the message "First Aid Station", the universal First Aid cross and heading "Emergency" in the color "Safety Green and White", from Grainger, model number LFSD903VSP, www.grainger.com.
 - f. Box Interior Finish: Stainless steel sheet, satin finish
 - g. Provide 1/4" diameter holds inside box on 4 sides for mounting in laboratory casework.
 - h. Install one first aid kit and one burn kit in each safety supply cabinet.
 - i. Quantity of safety supply cabinets: At locations shown in the drawings.
 - j. Shelf: Provide 1 shelf, centered.

D. First Aid Kit (Inside Safety Supply Cabinet):

1. Manufacturer: Johnson & Johnson, or equivalent products of Grainger
2. Product: Small Industrial First Aid Kit
3. Product Number: 39N794
4. Supplier: Grainger, 800-356-0783, website: www.grainger.com

5. Size: 6-1/2"H x 9-1/2"W x 2-3/4"D, or as required to fit into the safety cabinet
- E. Burn Kit (Inside Safety Supply Cabinet)
1. Manufacturer: North by Honeywell, or equivalent products of Grainger
 2. Product: Emergency Burn Kit
 3. Product Number: 019727-0014L
 4. Supplier: Grainger, 800-356-0783, website: www.grainger.com
 5. Size: 10"H x 7"W x 3"D, or as required to fit into the safety cabinet
- F. Laboratory Spill Cart (Equipment Number SC):
- NOTE: Item is OFOI and specification is provided for Owner's Benefit**
1. Supplier: Grainger, 800-356-0783, website: www.grainger.com
 2. Model No.: 2NCP2, 22 gal wheeled cart, 39"H x 18"W, fully stocked
 3. Quantity: Where shown on drawings
- G. Evidence Drying Cabinet – Ducted Exhaust (Equipment Number DC1 – Add Alternate): Product by Mystaire Inc., PO Box 825, Creedmoor, NC, 27522; www.mystaire.com, or approved equal manufacturers prior to General Contractor bid submission.
1. General: Ducted Forensic Evidence Drying Cabinets, *modified by the manufacturer to be connected to lab exhaust system*, designed to store a variety of evidence items, including clothing, shoes, blankets and other materials that must be kept in a controlled and stable environment while drying. Drying Cabinets shall include a self-contained air recirculation system with pre-filter. Provide units with manual wash down capability. Provide removable polypropylene trays and formalin vaporizer.
 - a. DC1: 32" wide Evidence Drying Cabinet, Ducted
 2. Materials:
 - a. Cabinet: White, chemical resistant polypropylene
 - b. Removable Shelves: Provide three, polypropylene
 - c. Door: Epoxy coated aluminum with 3/8" thick clear acrylic view panel
 - d. Coat Rack: Powder coated white stainless steel
 - e. Lock: Provide standard locking system, independently keyed for each cabinet.
 3. Electrical: 120V, 60Hz, GFI, plug-in cord, minimum 8' long
 4. Filters:
 - a. Particulate pre-filters
 - b. Provide 3 sets of extra filters for future use by Owner.
 5. Alarms: Visual air monitoring alarms shall be included to warn operator of low flow, to replace pre-filters and vaporizer control outlet.
 6. Exhaust duct Collar: Drying cabinets shall be exhausted through a flexible duct connection to the laboratory exhaust system.
 - a. Provide drying cabinets with the manufacturer's standard exhaust duct collar at top of unit.
 - b. Mechanical Contractor to provide flexible duct from the top of the drying cabinet to the ceiling. Flex duct shall be long enough to move cabinet out of its footprint for cleaning purposes.

- c. Exhaust airflow per manufacturer's design.
- 7. Plumbing:
 - a. Provide gravity drainage system with 1/2" MPT connection.
 - b. Provide 8' of hose to be field trimmed to fit and inserted into hub drain.
 - c. Provide drying cabinet with the manufacturer's standard hose (min. 8' length) and hanging rack on side of unit.
 - d. Provide connection to hose bib cold water supply at rear of unit with an 8' hose connected to hose bib.
- H. Bug Zapper (Equipment Number **BZ**): Manufactured by Paraclipse of Columbus, NE. Contact: www.paraclipse.com, 2271 East 29th Ave., Columbus, NE 68601, (800) 854-6379, or approved equal prior to bid submission.
 - 1. Provide Paraclipse automated insect control model: Paraclipse Terminator wall mounted with UV light attractants and trapping surface. Note: website does not display wall mount unit, but the unit is available by phone.
 - 2. Cartridge advance shall be automatic in 60-day increments.
 - 3. End of cartridge audible alarm.
 - 4. Provide 5 replacement cartridges as attic stock in addition to the one provided during installation for each unit.
- I. Laboratory Paper Towel Dispenser (Equipment Number **PTD**):

NOTE: Item is OFOI and specification is provided for Owner's Benefit

- 1. Manufacturer: Bobrick Washroom Equipment, or equal products by American Specialties, or Bradley Corporation
- 2. Model: B-262, ClassicSeries®
- 3. Material: Stainless steel
- 4. Finish: Satin
- 5. Size: 10-3/4" w x 14" h x 4" d
- 6. Mounting Type: Wall Surface
- 7. Quantify: Where shown on drawings

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Verify equipment rough-in before proceeding with the work in this Section.
- B. Coordinate with other trades for the proper and correct installation of plumbing and electrical rough-in, structural backing for items attached to walls and ceilings and for rough opening dimensions required for the installation of products in this Section.

3.2 INSTALLATION

- A. Install in accordance with manufacturer's instructions.
- B. Install in accordance with standards required by authorities having jurisdiction.
- C. Anchor equipment securely in place.
- D. Sequence installation to ensure utility connections are achieved in an orderly and expeditious manner.
- E. Touch-up minor damaged surfaces caused during installation. Replace damaged components as directed by Architect.
- F. Equipment in this Section shall be installed by the equipment subcontractor with all necessary fittings mounted for final connection by Divisions 23 and 26.
- G. Fixtures and accessories supplied and/or installed as a portion of the work shall be installed in a precise manner in accordance with manufacturer's directions. Where connections are required to electrical lines, the manufacturer is to provide items required for connection and coordinate the final installation made by the other Contractors.

3.3 CLEANING, ADJUSTING & PROTECTION

- A. Repair or remove and replace defective work as directed upon completion of installation.
- B. Clean shop finished surfaces, touch-up as required and remove or refinish damaged or soiled areas, as acceptable to Architect.
- C. Protection: Advise Contractor of procedures and precautions of protection of materials and installed laboratory furniture from damage by work of other trades.
- D. Adjust operating equipment to efficient operation for its intended use and as required by the manufacturer.

3.4 DEMONSTRATION

- A. Provide systems training and demonstration of all equipment operations and functions.
- B. Refer to Commissioning Specification Section for training requirements for specific systems and equipment. Training of the Owner's operation and maintenance personnel is required in cooperation with the Commissioning Consultant. A training agenda shall be prepared by the Contractor and approved by the Owner prior to training performance.

END OF SECTION 11 53 00

SECTION 11 53 60 - AUTOPSY & MORGUE EQUIPMENT

PART 1 - GENERAL

1.1 SUMMARY

- A. Furnish and install all autopsy and morgue equipment as shown and specified.
- B. Equipment items specified in this Section include the following:

Work included is <u>Contractor Furnished & Contractor Installed</u>	<u>CFCI</u>
1. Backdraft Dissecting Stations	ME1
2. Recessed Body Scale	ME5
3. Digital Readout for Body Scale	ME5A
4. Body Lift (Add Alternate)	ME14
5. Steam Kettle (Future)	ME15
6. Stainless Steel Corner Guards	CG
7. Stainless Steel Wall Guards	WG
Work below is included as <u>Owner Furnished & Owner Installed</u>	<u>OFOI</u>
8. Autopsy Carrier	ME2
9. Stainless Steel Autopsy Tray	ME2A
10. Bariatric Body Carrier with Attached SS Tray	ME3
11. Hydraulic Autopsy Carrier	ME17

- 1.2 RELATED DOCUMENTS: The completion of the work described in this Section may require work in or coordination with other Sections of these specifications. The Contractor and the subcontractor will be responsible for identifying and including all related work in other Sections of these specifications and/or drawings necessary for a complete installation of the work described in this Section. These related Sections include, but are not limited to the following:

- A. Section 12 35 53 – Laboratory Casework.
- B. Divisions 22, 23 and 26.
- C. System commissioning is a part of the construction process. Documentation and testing of systems, as well as training of the Owner's operation and maintenance personnel, is required in successful completion of all commissioning procedures, documentation and issue closure. Refer to Commissioning Specification Section for commissioning requirements.

1.3 SUBMITTALS

- A. Submit under provisions of Division 1.
- B. Shop Drawings: Indicate equipment locations, large scale plans, elevations, cross Sections, details, rough-in and anchor placement dimensions, tolerances and clearances required.

- C. Product Data: Provide manufacturer's technical data, including equipment dimensions and construction, equipment capacities, physical dimensions, utility and service requirements and locations, point load and factory finishes.
 - D. Manufacturer's Installation Instructions: Indicate special installation requirements.
 - E. Structural Calculations: Provide for body hoist system.
- 1.4 OPERATION AND MAINTENANCE DATA
- A. Submit information in bound manual form, typewritten or computer word-processed on 8-1/2" x 11" paper.
 - B. Operation Data: Include description of equipment operation, adjustments and testing required.
 - C. Maintenance Data: Identify system maintenance requirements, servicing cycles and spare part sources.
- 1.5 QUALITY ASSURANCE
- A. Manufacturer: Company specializing in manufacturing Products specified in this Section.
 - B. Single Source Responsibility: The dissecting stations and associated body transporter carts and body trays shall be provided by one manufacturer to ensure complete compatibility between all related components.
 - C. Electrical components including motors, disconnect switches, motor controllers, motor control devices and electrical circuits and connections shall conform to requirements of NFPA 70. All electrical wiring, conduit and all electrical devices necessary for the installation and operation of the system and equipment are furnished.
- 1.6 DELIVERY, STORAGE AND HANDLING
- A. Deliver, store, protect and handle products on the site in such a manner as to minimize the risk of damage, decay, deterioration or loss from theft.
 - B. All products shall be delivered to the job site in manufacturer's original unopened containers, crates or protective wrappings with the manufacturer's name and address clearly labeled thereon.
 - C. Accept products on site and inspect on arrival for damage.
- 1.7 FIELD COORDINATION WARRANTY
- A. Verify that field measurements are as indicated on shop drawings or as instructed by the manufacturer. Coordinate final openings, sizes and utility rough-in locations with the appropriate trades.
- 1.8 WARRANTY
- A. Provide warranty under provisions of Division 1.

PART 2 - PRODUCTS

2.1 ACCEPTABLE MANUFACTURERS

- A. Provide products as manufactured by Morteck Manufacturing, Azusa, CA; Ph. (800) 410-0100; www.mortechmfg.com, or equal products pre-approved in writing 10 days prior to bid date.

2.2 BACKDRAFT DISSECTING STATION (Equipment Number MEI): Basis of Design by Morteck Manufacturing, Inc. Cantilevered, wall mounted custom unit, similar to Model #1036-10 with size and configuration modifications as shown in the drawings. Any equal must be approved prior to bid submission.

A. Material and Fabrication:

1. Dissecting sink station shall be fabricated from Type 316 polished #4 finish stainless steel using all welded construction. Size, configuration and design of dissecting sink shall be in accordance with the drawings. Top with backsplash shall be 14-gauge material made into one smoothly integrated piece with all topside welds ground and polished to a sanitary finish.
 2. Sink top shall include a sink basin, full width drain boards, backsplash and a 2"x2" square edge with a 1/8" radius along working sides and front.
 3. Inside corners of drain board shall have 3/4" radii.
 4. Wall Attachment: Wall mounted dissecting station shall be cantilevered type. Number of supports shall be per manufacturer's standard design. Top rear flange on sink sets into a full-length heavy gauge stainless steel "Z" mounting bracket, with support gussets anchored to an engineered steel structure concealed in the wall. Engineered steel structure shall be coordinated by the Contractor with the wall attachment.
 5. Apron: 18-gauge custom fitted to conceal the front and both ends of the dissecting station.
 6. Depth of units shall be the manufacturer's standard 30" minimum and the width of units shall be as indicated on the drawings.
 7. Welding: Joints shall be strong, ductile welds using the heliarc method, with exposed surfaces ground and polished to match adjacent surfaces. Welds shall be homogenous with the material joined, and free of imperfections such as pits, runs, spatter or cracks. Spot welding is not acceptable.
 8. Refer to drawings for size and configuration of dissecting stations.
- B. Shelf: Shelf, including support brackets, shall be fabricated from a single piece of Type 316, 14 gauge, #4 finish stainless steel. Front and side edge of shelf shall be turned down 1".
- C. Cart Latch Assembly: Assembly shall be designed to secure a transporter to the dissecting station at the sink. A slide latch shall engage the transporter leg to securely hold transporter in position. Sink bracket shall be fabricated of 14-gauge stainless steel housing and 3/8" diameter steel rod shall be used for the slide latch. The system can be engaged from either side of the carrier. One motion secures both sides of the carrier.
- D. Removable Dissecting Surface: Surface shall be fabricated from 14-gauge, Type 316 #4 finish stainless steel with 1/2" diameter perforations on 2-11/16" centers each way. The design of the surface shall include a device to position and restrict movement during use. Cantilevered supports shall hold the top of the surface 1/2" below the top of the station rolled edge so as to nest. The drain board below the dissecting surface shall be completely clear of obstructions including bridging and supports.

- E. Drawers: Drawer bodies shall be one-piece construction with double pan fronts mounted on ball bearing slides. Built-in safety stops shall be provided to control drawer removal. Front and side panels of drawer units shall be 18-gauge, Type 316, #4 stainless steel, with joints made invisible by welding, grinding and polishing to blend with the original finish of the adjacent metal. Front face of drawers shall be recessed 1/2" from apron face. Apron drawer frame shall include a drip edge at the head to prevent liquids from dripping inside drawer body.
- F. Plumbing Fixtures: All exposed plumbing fixtures, lines and fittings shall be chrome-plated brass. Unexposed plumbing components shall be brass and copper. Each dissecting station to have the following:
1. Dissecting Area Rinse Assembly: Stainless steel tubing with end caps and spray nozzles to provide a constant flow of water beneath the dissecting surface. Cold water controls shall be mounted on the front of the rear backsplash. Manufacturer shall be responsible for furnishing an effective flushing system of proven design based on previous factory tests. Flushing action shall be designed to produce flooding over the entire drain board area without voids.
 2. Hydro-Aspirator: Shall contain a built-in vacuum breaker and control handle to be used to reverse the flow of water so as to direct it through the hose connections for either drawing fluid from the body cavity or water services. A clear vinyl plastic 10' hose with 1/8" wall and a "J" hook or hose rack along with a cold water control valve shall be mounted to the backsplash.
 3. Mixing Faucets: Each autopsy sink shall be equipped with two hot and cold water mixing faucets with gooseneck spouts and wrist paddle handles with built-in vacuum breakers for backflow prevention.
 4. Spray Hose Assembly: Spray hose assembly shall have flexible opaque internally braided 10' hose with chrome plated valve and hand controlled spray nozzle. Spray hose rack shall be mounted on the backsplash along with a hot & cold water control valve.
 5. Plumbing: Shall be pre-plumbed to a single connection point for each service. Plumbing connections are: Cold Water: 3/4"; Hot Water: 1/2"; Drain: 2".
 6. Backflow Prevention: Unit shall be designed to prevent back-siphonage and backpressure of contaminated water into the potable water supply.
- G. Disposer: Shall have the following features:
1. 2 HP, 115 VAC, 60 Hz, 1 Phase commercial type, having a totally enclosed motor with built-in overload protection, all rated for heavy-duty service.
 2. Exterior top shall be stainless steel and fitted with a rubber coupling / adapter mounting.
 3. Grinding and Cutting Chamber: Chamber shall be lined with stainless steel. Grind ring shall be internally toothed, high carbon steel with a hard, heat-treated surface. Turntable shall be stainless steel, balanced dynamically and fitted with forged stainless steel, anti-jamming impellers that eliminate the need for motor reversing. Impellers shall incorporate tungsten carbide tips and surgical steel shearing blades. Particle discharge ports shall be designed to not increase in size through usage.
 4. Disposer, vacuum breaker with water inlet to sink and switch shall be mounted at the factory. Switch shall be panel mounted with only the knob exposed. Provide a stainless-steel standpipe, solenoid valve and flow control valve.
- H. Electrical: Provide a convenience outlet combination ground fault circuit interrupter and duplex outlet with waterproof lift cover plate mount on a concealed, recessed conduit box. The whole assembly shall be panel mounted at the factory with only the plate exposed. Outlets shall be rated 15A, 125 VAC and shall accept polarized and non-polarized caps. Electrical shall be prewired to a single connection point. Dissecting station will require 2 circuits: (1) 115v/60/1 20 amp circuit and (1) 115v/60/1 20 amp circuit.

- I. Ventilation: Provide three linear stainless steel exhaust air registers above the dissecting station for mounting by the mechanical subcontractor. Air registers shall be a combination of a grille with fixed face bars positioned horizontally and an opposed blade damper. The face bars shall be non-adjustable and shall be set at a 45° angle, 0.67" on center. Each grille shall be provided with a rear damper, which shall be designed with a rear mounted drainback lip, whose function is to drain back water which splashes into the grille. Actual size of registers shall be as shown in the drawings. Dissecting station manufacturer shall coordinate size, location and installation of air register assemblies with the HVAC contractor. Exhaust CFM per grille shall be approximately 200 CFM for each grille resulting in a total exhaust of 1,000 CFM per station.
- J. Provide high intensity watertight task light fixtures over the work areas' full width of the dissecting station, as shown on the drawings with LED fixtures having a color temperature of 3500° K and CRI of 90. The units shall be UL approved for damp locations.
- K. Mounting Height: Refer to drawings.
- L. Accessories: Provide (1) of the following items for each dissecting station:
 1. Provide one stainless steel post mortem scale; Model 1309DD-AS with one scale pole; Model LW411, with two modified brackets, one on each end of the dissecting station and 360 degree rotation with locking knob.
 2. One set of molded plastic body supports; Model LW392.
 3. Over-the-body raised dissecting platform; Model LW380. All 316 stainless steel construction with recessed receiver and white poly dissecting board.
 4. Solid plastic photo blue poly dissecting board custom fit to fit over-the-body dissection platform; Model LW389.
 5. 6 position Teflon headrest; Model LW390.
 6. Welded in place 10" projecting x 12" wide gram scale shelf where shown in the drawings. Electrical receptacle for each shelf per drawing. Small gram scale not in contract.

2.3 AUTOPSY CARRIER (Equipment Number **ME2**); Model# 600038MOD, Standard Autopsy Carrier with Rollers by Morteck Manufacturing, Inc., or equal product approved prior to bid submission.

NOTE: Item is OFOI and specification is provided for Owner's Benefit

- A. Materials and Fabrication: Entire frame shall be welded, Type 316, 11 gauge polished, stainless steel. Frame shall be designed specifically to receive the specified body transported tray and shall include a 1-1/2" slope toward the dissecting sink when engaged in the sink's locking mechanism. When in position at the dissection sink, the end of the tray shall overhang above the sink such that the sump drain in the tray can be emptied directly into the sink. Materials shall be as follows:
- B. Legs: 1-1/2" O.D., 11-gauge tubing.
- C. Tubing: 1-1/4", 11-gauge tubing and top tray holder: 1", 11-gauge tubing.
- D. Tray Supports: 11-gauge formed sections designed to securely hold tray in position without the use of any mechanical fasteners. Transporter shall be designed with a permanent slope of 1-1/2".
- E. Tray Rollers: Ten nylon maintenance free rollers.
- F. Wheels: 8" diameter rubber tires with swivel casters, all of which shall be equipped with wheel brakes.

- G. Quantity: **Per plan.**
- 2.4 STAINLESS STEEL BODY TRAYS – (Equipment Number **ME2A**); Model T3614 by Morteck Manufacturing, Inc., or equal product approved prior to bid submission.
- NOTE: Item is OFOI and specification is provided for Owner's Benefit**
- A. Material: 14 gauge, Type 316 stainless steel #4 finish.
- B. Size: 31"W x 82"L x 1.5"H nominal with a design load of 500 pounds.
- C. Sump: Provide with integral sump at drain end of tray with "V" shaped creased tray bottom to promote positive drainage to drain hole without pooling within tray. Drain shall be 1-1/4" diameter with rubber stopper provided for each tray.
- D. Quantity: **Per plan.**
- 2.5 BARIATRIC BODY CARRIER WITH ATTACHED STAINLESS STEEL TRAY (Equipment Number **ME3**); Model# 600009 by Morteck Manufacturing, Inc., or equal product approved prior to bid submission.
- NOTE: Item is OFOI and specification is provided for Owner's Benefit**
- A. Materials and Fabrication: Entire frame shall be welded, Type 316, 11gauge polished stainless steel. Top Frame shall be designed specifically to receive the bariatric body transporter tray and shall include a 1-1/2" slope toward the dissecting sink when engaged in the sink's locking mechanism. When in position at the dissecting sink, the end of the tray shall overhang above the sink such that the sump drain in the tray can be emptied directly into the sink. Additionally, provide a flexible hose with the table to enable the sump to be drained into a floor sink or floor drain. Materials shall be as follows:
- B. Legs: 1-1/2" square, 11-gauge tubing.
- C. Cross Rails: 1-1/2" square, 11-gauge tubing.
- D. Tray Supports: 11 gauge formed Sections designed to securely hold tray in position without the use of any mechanical fasteners. Transporter top frame shall be designed with a permanent slope of 1-1/2".
- E. Bariatric Tray: 12 gauge formed, Type 316 stainless steel with a #4 finish. Overall tray size to be 84"L x 42"W x 1-1/2"D. End toward the autopsy sink shall be tapered for use with standard autopsy station sink openings.
- F. Wheels: 8" diameter swivel casters, all of which shall be equipped with wheel brakes and shall have an overall capacity of at least 1000 lbs.
- G. Height Adjustment: Shall be via hand crank mechanism and elevate the tray height on the head end from 30.5" low to 36.5" high and on the drain end from 27.5" low to 33.5" high. The lift system consists of four lift cylinders which are connected by flexible tubing to central lift pump which is in turn activated by a drive mechanism. All cylinders shall work in unison – even under unbalanced loading conditions to maintain a consistent 3" slope to drain. All flexible tubing lines shall be concealed and protected under the lower stainless steel shelf of the carrier. Lift capacity shall be a minimum of 1000 lbs.
- H. Quantity: **Per plan.**

- 2.6 RECESSED BODY SCALE WITH DIGITAL READOUT (Equipment Number **ME5**): Model LW458 QC by Mortech Manufacturing, Inc., Manufactured by Rice Lake Weighing Systems Roughdeck QC (Quick Clean) #50411 with Model 420 Plus HMI Digital Weight Indicator, or equal products approved prior to bid submission.
- A. Recessed pit mounted floor scale with digital readout, pit frame and weight plate. Weight plate shall be a Type 304 stainless steel 4' x 6' "*Slip NOT*" plate. Capacity shall be 5000 lbs. minimum. Unit shall be self-contained, stainless steel full load cell floor scale, for high accuracy, heavy duty applications, which can be installed in a shallow pit so weight plate is flush with floor. Provide unit with the following features:
1. 100% end loading capacity to accurately read concentrated loads.
 2. Dual gas-shock lift with gentle close system to tilt the platform up 45°, permitting access to the pit area for complete wash down and sanitation.
 3. All Type 304 stainless steel construction.
 4. Provide unit with "Quick Pit Frame" to allow the scale to be mounted in a pit flush with the floor.
 5. Hermetically sealed waterproofed electronics and load cells.
 6. Impact protected load cells.
- B. Accessories:
1. 420 Plus HMI Digital Weight Indicator (Equipment Number **ME5A**); UL/SCA approved with the following features:
 - a. Zero indicator.
 - b. Over capacity.
 - c. Under zero display.
 - d. Zero span adjust.
 - e. Auto zero verification.
 - f. Selectable over capacity.
 - g. Readability: 0.2 lb.
 - h. Initial / span range.
 - i. Motion detection.
 - j. Automatic zero maintenance.
 - k. Display verification.
 - l. Pushbutton and keyboard tare weights.
 - m. NTEP approved.
 - n. Stainless steel washdown enclosure.
 2. Transmission Line: Provide transmission line footage as required to span the distance between the scale and indicator within concealed conduit in the floor slab. Conduit provided by Division 26.
 3. Enclosure: NEMA 4X stainless steel enclosure; 11.25" H x 13.88"W x 5.5"D.
- C. Manufacturer shall have at least five years' experience in the design, fabrication and construction of floor scales used specifically for morgue use. Scales and indicators shall meet or exceed requirements for Class II, III or IIII devices.

2.7 BODY LIFT (Equipment Number **ME14 – Add Alternate**): Model Mortuary Lift Ultimate 1000 manufactured by Mortuary Lift Company, 329 10th Ave SE, Suite 213, Cedar Rapids, Iowa, 52401, www.mortuarylift.com, (800) 628-8809, or equal product approved prior to General Contractor bid submission.

A. Body Hoist Features:

1. Ceiling mounted or suspended track system.
2. Load Capacity: 1,000 lbs.
3. Power requirements: 100v, 15a dedicated circuit ceiling outlet
4. Track system: Steel rails

B. Structural Support:

1. Submit drawings for the design of support framing stamped by an engineer licensed in the state of Florida.
2. Submit calculations stamped by an engineer licensed in the state of Florida. Calculations shall meet the project seismic design parameters. See structural drawings and building code requirements.
3. The design must meet all requirements from the manufacturer for installation and performance.
4. The support structure must be coordinated with the field conditions and coordinated with all trades. Design must be constructible.

2.8 STEAM KETTLE (Equipment Number **ME15 – Future**): Model KELS-40 Steam Kettle as manufactured by Southbend, Farquay-Varina, NC, www.southbndnc.com, Phone (919) 762-1000, or equal product approved prior to General Contractor bid submission.

2.9 HYDRAULIC AUTOPSY CARRIER (Equipment Number **ME17**): Hydraulic Autopsy Carrier Model 600025 as manufactured by Mortechn Manufacturing, Azusa, CA, www.Mortechmfg.com, Phone: (800) 410-0100, or equal product approved prior to General Contractor bid submission.

NOTE: Item is OFOI and specification is provided for Owner's Benefit

A. Carrier Features:

1. Tilting and Height adjustment by hydraulic foot pedal.
2. Wheels: All wheels 8"Ø phenolic and swivel
3. Floor locks
4. Load Capacity: 600 lbs.
5. Maximum table height: 40.5"
6. Must be compatible with Mortechn tray T3614 (Equipment number **ME2A**).

B. Base Material: Solid surface

C. Size: 31"W x 81"L x 28.5"H.

2.10 STAINLESS STEEL CORNER GUARDS (Equipment Number **CG**): Satin finished, 0.0625-inch (1.6mm) minimum, stainless steel sheet corner guards; height of 84". Provide 90° turn, unless otherwise

indicated and formed edges. All edges shall be rounded with no sharp edges. Provide units covered with paper for temporary protection until corner guards are installed.

- A. Wing Size: 3" x 3" (89mm x 89mm)
 - B. Mounting Method: Double-faced, self-adhesive foam tape, plus flush stainless steel machine screws.
 - C. Corner Radius: 1/8" (3.2mm)
 - D. Refer to Details: **4/L-501**
 - E. Manufacturers:
 - 1. Bobrick
 - 2. Koroguard
 - 3. Hiawatha
- 2.11 STAINLESS STEEL WALL GUARDS (Equipment Number **WG**): Satin finished, 0.0625-inch (1.6mm) minimum, stainless steel sheet wall guards. Provide formed edges. All edges shall be rounded with no sharp edges. Provide units covered with paper for temporary protection until walls guards are installed.
- A. Size: 5-1/2" x 1-3/4"
 - B. Mounting method: Flush stainless steel machine screws, per details.
 - C. Corner radius: 1/8" (3.2mm)
 - D. Refer to detail: **3/L-502**
 - E. Manufacturers:
 - 1. Bobrick
 - 2. Korogard
 - 3. Hiawatha

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Verify equipment rough-in before proceeding with the work in this Section.
- B. Coordinate with other trades for the proper and correct installation of plumbing and electrical rough-in, structural backing for items attached to walls and for rough opening dimensions required for the installation of products in this Section.
- C. Examine substrate surfaces and associated work and conditions under which work will be installed.
- D. Do not proceed until unsatisfactory conditions have been corrected in a manner complying with the Contract Documents and acceptable to the Installer. Starting of work within a particular area will be construed as installer's acceptance of surface conditions.

3.2 INSTALLATION

- A. Install in accordance with manufacturer's instructions.
- B. Install in accordance with standards required by authority having jurisdiction.
- C. Anchor equipment securely in place.
- D. Sequence installation to ensure utility connections are achieved in an orderly and expeditious manner.
- E. Touch-up minor damaged surfaces caused during installation. Replace damaged components as directed by Architect.
- F. Equipment in this Section shall be installed with all necessary fittings mounted for final connection by Divisions 22, 23 and 26.

3.3 ADJUSTING

- A. Adjust operating equipment to efficient operation for its intended use and as required by the manufacturer.
- B. Make final adjustments to dissecting station and equipment, including drawers, hardware, fixtures and other moving or operating parts to ensure proper and smooth operation.

3.4 CLEANING

- A. Clean equipment and all surfaces as recommended by the manufacturer, rendering all work in a new and unused appearance. Touch up as required.
- B. Clean adjacent construction and surfaces which may have been soiled in the course of installation of work in this Section.

3.5 PROTECTION OF FINISHED WORK

- A. Provide all necessary protective measures to prevent exposure of equipment and surfaces from exposure to other construction activity.
- B. Advise Contractor of procedures and precautions for protection of material and installed equipment from damage by work of other trades.

3.6 DEMONSTRATION

- A. Provide equipment training and demonstration of all equipment operations and functions to representatives of the Owner.

END OF SECTION 11 53 60

SECTION 12 35 53 - LABORATORY CASEWORK

PART 1 - GENERAL

1.1 DESCRIPTION

A. Work Included:

1. Furnishing all laboratory cabinets and casework, including lab countertops, lab sinks, ledges, supporting structures, lab service fittings and miscellaneous items of equipment as listed below and in these specifications or equipment schedules including delivery to the building, setting in place, leveling and scribing to walls and floors as required. Furnish and install all filler panels, knee space panels and scribes as indicated by drawings. Divisions 22, 23 and 26 shall be responsible for final connections of the laboratory sinks, laboratory fixtures and accessories specified herein.
 - a. Suspended Stainless Steel Casework, Tops and Shelving
 - b. Flammable Chemical Storage Cabinet - Owner Furnished, Owner Installed (OFOI)
 - c. Narcotics Cabinet
 - d. Mobile Tables
 - e. Laboratory Sinks
 - f. Laboratory Plumbing & Electrical Fittings
 - g. Combination Emergency Eyewash and Shower
 - h. Deck Mounted Drench Hose Eyewashes
 - i. Butcher Paper Dispensers
2. Furnishing and delivery of all utility service outlet accessory fittings as listed in these specifications, equipment schedules or as indicated by drawings as mounted on the laboratory furniture. The above-defined items shall be furnished assembled with supply tank nipples and lock nuts, not attached, loose in boxes and properly marked for delivery to the mechanical contractor (except for pre-wired or pre-plumbed items, which are to be delivered completely assembled). All plumbing and electrical fittings will be packaged separately and properly marked for delivery to the appropriate contractor.
3. Furnishing and delivering, packed in boxes for installation by the Contractor, all drains, drain troughs, overflows and sink outlets with integral tailpieces, which occur above the floor, and where these items are part of the equipment or listing in the specifications, equipment schedules or indicated by the drawings. Integral tailpieces, when required, shall be in accordance with the manufacturer's standards. All tailpieces shall be furnished less the couplings required to connect them to the drain piping system.
4. Furnishing service strip supports where specified, and setting in place service tunnels, service turrets, supporting structures and reagent racks of the type indicated by the details.
5. Removal of all debris, dirt and rubbish accumulated as a result of the installation of the laboratory furniture, leaving the premises clean and orderly.

B. Work Not Included in this Section

1. Equipment, materials and labor which are the responsibility of other subcontractors, as determined by the General Contractor may include the following:
 - a. Electrical receptacles, except where integral to casework, pulling of wire and connecting of electrical fittings in service chases and countertop outlets that are not part of the free standing and mobile casework.
 - b. Plumbing fittings not included in this section, vacuum breakers (except in-line vacuum breakers specified in this section), piping or other plumbing features, as required to meet local code authority requirements.

- 1.2 RELATED DOCUMENTS: The completion of the work described in this Section may require work in or coordination with other Sections of these specifications. The Contractor and the subcontractor will be responsible for identifying and including all related work in other Sections of these specifications and / or drawings necessary for a complete installation of the work described in this Section. These related sections include, but are not limited to the following:
 - A. Drawings and general provisions of Contract, including General and Supplementary Conditions, including Division 1 specifications, apply to this Section.
 - B. Refer to Divisions 22, 23 and 26 and the Mechanical and Electrical drawings for related plumbing, mechanical and electrical work, including plumbing work related to purified water systems.
 - C. Division 5 & 6: Blocking and backing in walls for anchorage of cabinetry
 - D. Division 9: Blocking and backing in walls for anchorage of cabinetry
 - E. Division 9: Base molding and flooring
 - F. Division 11 53 00: Laboratory Equipment
 - G. Division 23: Laboratory Temperature and Airflow Control System
 - H. Division 23: Control Instrumentation
 - I. Division 23: Air Valves
 - J. Division 23: Direct Digital Control System
 - K. Division 23: Control & Automation Material
 - L. Division 23: Sequence of Operation
 - M. Division 26: Electrical Fittings and Connections
 - N. System commissioning is a part of the construction process. Documentation and testing of systems, as well as training of the Owner's operation and maintenance personnel, is required in cooperation with the Commissioning Consultant. Substantial Completion is dependent on successful completion of all commissioning procedures, documentation and issue closure. Refer to Commissioning Specification Section for detailed commissioning requirements.

- 1.3 REFERENCES
 - A. Laboratory Casework:

1. SAMA Standard Performance Requirements
 2. SEFA Standard Performance Requirements
- B. Flammable Chemical Storage Cabinets (**OFOI**):
1. OSHA Section 1910.106, General Industry Standards
 2. NFPA 30, Flammable and Combustible Liquids Code
 3. UL 1275, Flammable Liquid Storage Cabinets
- C. Emergency Eyewash and Shower:
1. ANSI Z-358.1
 2. ADA

1.4 SUBMITTALS

- A. Submit under provisions of Division 1, General Requirements.
- B. Shop Drawings: Provide 1 original reproducible set, 1/2"=1'-0" scale elevations and 1/4"=1'-0" plans of casework and equipment locations, showing cross sections, details, rough-in and anchor placement dimensions and tolerances and clearances required. Indicate relation to surrounding walls, ceiling, windows, doors and other building components. Show rough-in requirements. Show locations of all required framing, bucks, metal grounds or reinforcements in walls, floors and ceilings to adequately support the laboratory casework, equipment and for proper anchoring and support. Additionally, provide a keying schedule for all cabinet locks. Provide an additional 2 sets of copies, over and above the required number of copies for A/E, for review by the Owner.
- C. Product Data: Provide manufacturer's technical data for each component and item of laboratory casework and equipment specified, including equipment dimensions and construction, configurations, color selection charts, attachment and anchorage details, equipment capacities, physical dimensions, construction details, utility and service requirements and locations, point loads and factory finishes.
1. Manufacturer's Installation Instruction: Indicate special installation requirements.
 2. Seismic Restraints: The lab casework manufacturer / installer shall install the casework to resist seismic loading as required by the local governing codes. Provide all seismic details with lab casework and fume hood submittals indicating required wall construction, such as wall stud gauge and size, point loads, etc. install all anchorage devices, including special legs and / or braces required for seismic restraint of lab casework, fume hoods and accessories to satisfy all governing code requirements for seismic anchorage of equipment.
 3. Instruction: Submit for review and approval written approval instructions in booklet form providing additional details on safe operation and maintenance.
- D. Samples: Provide the following samples:
1. Finish Samples: Submit 5 sets of samples of each color of finish for casework, work surfaces and other prefinished work as well as accessories for selection by interior designer.
 2. Door and Drawer Samples: Provide a complete finished door unit, 12" wide, and a complete drawer unit, 12" wide, with finished drawer front and slides attached.
 3. Hardware Samples: Provide 2 sets of all hardware components, with one set installed on the samples required in item 2.
 4. 4"x4" countertop samples.

- E. Mock Up: On site review prior to primary installation:
 - 1. Install all laboratory casework and fittings in an Architect selected smaller representative lab area prior to installing the bulk of casework throughout the project and request review.

1.5 OPERATION AND MAINTENANCE DATA

- A. Submit information in bound manual form, type written or computer word processed on 8-1/2" x 11" paper.
- B. Operation Data: Include description of required operation, adjusting and testing.
- C. Maintenance Data: Identify system maintenance requirements, servicing cycles and spare part sources.

1.6 QUALITY ASSURANCE

- A. Single source responsibility: Laboratory furniture system, casework, work surfaces, laboratory equipment and accessories shall be manufactured or finished by a single laboratory furniture company.
- B. Manufacturer's Qualifications: Modern plant with proper tools, dies, fixtures and skilled workmen to produce high quality laboratory casework and equipment. Installers shall be factory certified by the manufacturers.
- C. Coordination Drawings: The supplier / installer shall coordinate the installation of all products under the section, including mechanical, plumbing and electrical items, which are provided by the supplier and installed by other contractors. Laboratory casework manufacturer shall be responsible for generating layout drawings and distributing them to the mechanical, electrical and plumbing contractors for coordination and accurate locations of cutouts and service connections required by each discipline, prior to generating final shop drawings.
- D. Owner has the right to inspect equipment at the manufacturer's factory prior to shipment. Equipment found not to be in conformance with requirements of the Contract Documents might be rejected.
- E. Installer's qualifications: Installer shall be factory certified by the manufacturer.
- F. Performance requirements: Structural performance requirements: Casework components shall withstand the following minimum loads without damage to the component or to the casework operation:
 - 1. Steel base unit load capacity: 500 lbs. per lineal foot.
 - 2. Suspended units: 300 lbs.
 - 3. Drawers in a cabinet: 150 lbs.
 - 4. Utility Tables (4 legged): 300 lbs. (12 sf in table area or less); 500 lbs. (over 12 sf in table area)
 - 5. Hanging wall cases or countertops: 300 lbs.
 - 6. Load capacity for shelves of base units, wall cases and tall cases: 40 lbs. per square foot.

1.7 DELIVERY, STORAGE AND HANDLING

- A. Deliver, store, protect and handle products on the site in such a manner as to minimize the risk of damage, decay, deterioration or loss from theft.

- B. All products shall be delivered to the job site in manufacturer's original unopened containers, crates or protective wrappings with the manufacturer's name and addressed clearly labeled thereon.
- C. Accept products on site and inspect on arrival for damage.
- D. Protect product from damage of soiling at all times. Keep products covered with polyethylene film or other suitable protective coverings. Protect installed casework throughout construction period with corrugated cardboard completely covering the top and securely taped to edges. Mark cardboard in large lettering "No Standing".

1.8 PROJECT CONDITIONS

- A. Do not deliver or install laboratory casework in the final work until building is secure and weather-tight, all painting is completed and ceilings, overhead ductwork and lighting are installed and HVAC systems are operational and capable of maintaining the building temperature and humidity at occupancy levels throughout the remainder of the construction period.

1.9 FIELD MEASUREMENTS

- A. Verify field measurements shown on shop drawings or as instructed by manufacturer.

1.10 WARRANTY

- A. Provide warranty under provisions of Division 1.

PART 2 - PRODUCTS

2.1 ACCEPTABLE PRODUCTS (Cantilevered and Mobile Lab Casework)

- A. Subject to compliance with these specifications, acceptable products **are limited to** those manufactured and provided by the following companies. While this specification is based on Kewaunee Scientific Corporation, products by the other manufacturers listed below are considered equals provided they meet the standard of design and quality for materials, construction and workmanship as described in this specification.

1. **Kewaunee Scientific Corporation:**

- a. Suspended Stainless Steel Lab Casework System: Full Flush Overlay

2. **Mott Manufacturing:**

- a. Suspended Stainless Steel Lab Casework System: Full Flush Overlay

3. **Bedcolab:**

- a. Suspended Stainless Steel Lab Casework System: Full Flush Overlay

4. **Mortech Manufacturing:**

- a. Suspended Stainless Steel Lab Casework System: Full Flush Overlay
- b. Stainless Steel Laboratory Countertop Surfaces and Backsplashes

- B. Fixtures:

1. Watersaver Faucet Company
2. T&S Brass
3. Chicago Faucet

2.2 HARDWARE

A. Hardware and Trim:

1. Drawer and Door Pulls: Drawer and door pulls shall be modern design, offering a comfortable handgrip and be securely fastened to doors and drawers. Two pulls shall be required on all drawers over 30" long. Pull to be stainless steel "Water Fall" design.
2. Flush Pulls: Flush pulls for sliding doors shall be satin finish stainless steel, providing a recessed finger grip. Finger holes or slots machined into doors will not be acceptable.
3. Hinges: Hinges shall be the five (5) knuckle institutional, offset type for all swinging doors. Hinges shall be 2-3/4" long, one (1) pair for doors less than 4 ft. in height and 1-1/2 pair on doors over 4 ft. in height. Hinges are mounted with flathead screws, so applied to door and cabinet to withstand a weight load of 150 lbs. minimum. All hinges shall be satin finish stainless steel.
4. Locks: 5-pin locking system, heavy-duty cylinder type, capable of 75 pure key changes (unique keys), heavy-duty cylinder type. Exposed lock noses shall be dull nickel (satin) plated and stamped with identifying numbers. Locks shall have capacity for 225 primary key changes. The keying schedule shall incorporate the following general requirement:
 - a. Keys: Stamped brass available from manufacturer or local locksmith and supplied in the following quantities unless otherwise specified:
 - 1) 2 – for each keyed different lock
5. Positive Catches: Positive catches shall be used on swinging doors. Provide a two-piece heavy-duty cam action positive catch. The main body of the catch shall be confined within an integral cabinet top or divider rail, while latching post shall be mounted on the hinge side of the door. Polyethylene roller type catches are not acceptable. Full height cases shall have latching devices located on the structurally fixed center shelf. The left-hand door shall have a positive catch and the right hand door shall have the roller type catch.
6. Elbow Catches: When locks are specified, elbow catches shall be utilized. Elbow catches and strike plates shall be used on left hand doors of double door cases and are to be case aluminum with bronze finish.
7. Leg Shoes: Leg shoes shall be provided on all table legs, unless otherwise specified, to conceal leveling device. Shoes shall be 1-1/2" high and a pliable, black vinyl material. Use of a leg shoe which does not conceal leveling device will not be acceptable.
8. Floor Glides: Floor glides, where specified for movable open-leg tables, shall be a non-marring material at least 1" diameter to prevent indenting on composition flooring and shall have at least a 5/8" height adjustment. Use of metal buttons will not be acceptable.
9. Shelf Support Clips: Shelf support clips shall be double pin type for mounting on interior of cabinetwork. Clips shall be corrosion resistant and shall retain shelves from accidental removal. Shelves are adjustable on 32 mm centers. Surface mounted metal support strips and clips subject to corrosion are not acceptable.
10. Drawer Suspension: Mechanical slides shall be:
 - a. Drawer Suspension: Drawer slides shall be as made by Accuride or approved equal approved prior to bid with a standard clear zinc finish.

- 1) Light duty, 24" wide or less: Accuride 3834 all ball bearing, rail mount, full extension +1" over travel slides, hold open detent with a 100 lb./pair load rating.
 - 2) Medium duty, 33.5" wide or less: Accuride 7434 all ball bearing, rail mount, full extension +1" over travel slides, hold open detent with a 100 lb./pair load rating and progressive movement.
 - 3) Heavy duty, 42" wide or less: Accuride 3640 all ball bearing, rail mount, full extension +1" over travel slides, hold open detent with a 200 lb./pair load rating and sequential movement.
- b. File drawers to be equipped with full extension with over-travel 150 lb. dynamic zinc plated Accuride 4034 series, or equal.
11. Label Holders: Furnish and install label holders on each drawer and each hinged casework door. Label holders shall be Kewaunee part number F-0260-00 (Aluminum) or approved equal.
 12. Seismic Lips: Furnish 3/16" x 2" clear Plexiglas (acrylic) lips at all open shelves other than the metal shelves.

2.3 SUSPENDED STAINLESS STEEL CASEWORK, TOPS & SHELVING

A. General: **ALL AUTOPSY CASEWORK AND MOBILE TABLES TO BE STAINLESS STEEL.**

1. Provide stainless steel casework where shown on the drawings and as specified herein. Cabinets shall be constructed as cantilevered, independent cases. Only tall cabinets rest on the floor.
2. Flush Construction: Surfaces of doors, drawers and panel faces shall align with cabinet fronts without overlap of case ends, top or bottom rails. Horizontal and vertical case shell members (panels, top rails and bottoms) shall meet in the same plane without overlap, cracks or crevices.
3. Slimline styling: Front width of end panels 3/4" and front height of top and bottom members 1".
4. Self-supporting Units: Completely welded shell assembly without applied panels at ends, backs or bottoms, so that cases can be used interchangeably or as a single, stand-alone unit.
5. Interior of Case Units: Easily cleanable, flush interior. Base cabinets, 30" and wider with double swinging doors shall provide full access to complete interior without center vertical post.
6. Drawers: Sized on a modular basis for interchange to meet varying storage needs and designed to be easily removable in field without the use of special tools.
7. Case Openings: Rabbeted-like joints on all four sides of case openings for hinged doors and two sides for sliding doors in order to provide dust resistant case.
8. Framed Glazed Doors: Identical in construction, hardware and installation to solid panel doors. Design frame glazed doors to be removable for glass replacement.

B. Casework Materials:

1. Sheet steel: Mild, cold rolled and leveled #316 stainless steel (#4 polished sheen on all exposed surfaces).
2. Minimum Gauges:
 - a. 20 gauge: Solid door interior panels, drawer fronts, scribing strips, filler panels, enclosures, drawer bodies, shelves, security panels and sloping tops.
 - b. 18 Gauge: Case tops, ends, bottoms, bases, vertical posts, uprights, glazed door members, door exterior panels and access panels.
 - c. 16 Gauge: Top front rails, top rear gussets, intermediate horizontal rails, table legs and frames, leg rails and stretchers.

- d. 14 Gauge: Drawer suspensions, door and case hinge reinforcements and front corner reinforcements.
 - e. 11 Gauge: Table leg corner brackets and gussets for leveling screws.
 - f. Glass for glazed swinging and sliding doors: 1/8" (3mm) framed doors, 7/32" (6mm) thick, clear tempered glass for unframed doors.
3. Casework Fabrication:
- a. Base Units and Cases:
 - 1) Standard height base units: End panels and back reinforced with internal reinforcing front and rear posts.
 - 2) Tall Cases: Formed end panels with front and rear reinforcing post channels; back shall be formed stainless steel panel, recessed 3/4" for mounting purposes.
 - 3) Posts: Front post fully closed with full height reinforcing upright. Shelf adjustment holes in front and rear posts shall be perfectly aligned for level setting, adjustable to 1/2" o.c.
 - 4) Secure intersection of case members with spot and arc welds. Provide gusset reinforcement at front corners.
 - 5) Base unit backs: Provide drawer units without backs and cupboard units with removable backs for access to services behind units.
 - 6) Bottoms: Base units and wall cases shall have one piece bottom with front edge formed into front rail, rabbeted as required for swinging doors and drawers and flush design for sliding doors.
 - 7) Top rail for base units: Interlock with end panels, flush with front of unit.
 - 8) Horizontal intermediate rails: recessed behind doors and drawer fronts.
 - 9) Base for base units: 4" high x 3" deep with formed steel base and 11 gauge die formed stainless steel gussets at corners. Provide 3/8" diameter leveling screw with integral bottom flange of minimum 0.56 square inch area at each corner, accessible through openings in toe space.
 - 10) Tops of wall cases: One piece with front edge formed into front rail.
 - 11) Wall Cabinets shall have corner gussets providing reinforcing support and containing shelf clip adjustment slots. Shelving supported by the clips mounted to holes in the rear (back) of the wall cabinet are not allowed.
 - 12) Suspended cabinets are manufactured from one piece, full wrap around steel construction. Welded panel construction is not acceptable. Rear panels must be solid and not perforated for suspending shelves.
 - b. Drawers:
 - 1) Drawer fronts: 3/4" thick, double wall construction, sound deadened.
 - 2) Drawer bodies: Bottom and sides formed into one-piece center section with bottom and sides coved and formed top edges. Front and back panels spot welded to center section.
 - 3) Provide drawer with rubber bumpers. Friction centering devices are not acceptable.
 - 4) File drawers: Provide with 150# full extension slides for full access and operation.
 - c. Doors:

- 1) Solid panel doors: 3/4" thick, double wall, telescoping box stainless steel construction with interior polished and sound deadened, top corners welded and ground smooth. Reinforce interior of front panel with welded stainless steel hat channels. Hinges with screws to integral 14 gauge reinforcing in case and door. Hinges shall be removable; welding of hinges not acceptable. Doors shall close against rubber bumpers.
 - 2) Frame glazed doors: Outer head to be one piece construction. Inner head to consist of top, bottom and side framing members which are removable for installation or replacement of glass. Provide continuous vinyl glazing retainer to receive glass. In all other respects, framed glazed door construction and quality shall match solid panel doors.
- d. Shelves:
- 1) Form front and back edges down and back 3/4". Form ends down 3/4".
 - 2) Reinforce shelves over 36" long with welded hat channel reinforcement the full width of shelf.
 - 3) Pull out shelves: Same suspension as specified for drawers.
- e. Structural Cantilevered Support Frames:
- 1) 1" steel standard frame with a minimum load capacity of 400 lbs. per frame.
 - 2) Vertical support frame members shall be surface attached to the wall system designed by a licensed structural engineer.
 - 3) Vertical supports shall be spaced no greater than 24" apart and shall not be visible.
 - 4) Vertical support frames may not be visible from the front casework elevation.
- f. Base molding: Integral base by flooring contractor where casework may rest on floor.
4. Stainless Steel Worksurface (SS & SSME):
- a. Material: 14 gauge, Type 316 stainless steel with No. 4 polished finish on all exposed surfaces and edges. Form tops with one inch lip and 1/2" return flange and provide 16 gauge reinforcing channels applied to underside as required for rigidity and sound dampening. Form edges, flanges and curbs integrally with top from one sheet of metal.
 - b. Tops: Form tops with 1" lip and 1/2" return flange. Provide die formed 3/16" high integral marine edges at **SSME** countertops only. Provide 16 gauge stainless steel reinforcing channels applied to underside as required for rigidity and sound dampening. Form edges, flanges and curbs integrally with top from one sheet of metal.
 - c. Sink tops: Provide seamless, die formed 3/16" high integral marine edges at **SSME** sink tops. Unless otherwise noted, provide plain edges at all other tops (**SS** countertops). Coat underside of all with sound dampening material.
 - d. Sink Bowls: All sink bowls are made from 16 gauge Type 316 stainless steel. Electrically weld stainless steel bowls to opening in top. Grind welds flush and polish to a satin finish to produce an integral unit with invisible joint line. Cover underside of sink bowls with sound dampening material.
 - e. Joints: Electrically weld all shop joints; grind smooth and polish. Design field joints to be mechanically bolted and supported full length, resulting in a hairline seam with flat, level surfaces on each side of joint.
 - f. Sound dampening material: Material shall be waterborne and non-flammable in its liquid state. Material to contain clay, which will act as a flame retardant. Material shall contain no volatile organic compounds (VOC). Film thickness of spray-applied product shall be approximately 20 mil.

- g. Independent shelving: Stainless Steel Shelving: Smart Track system model SMS series as manufactured by InterMetro Industries Corporation, Wilkes Barre, PA 18705. Super Erecta wire, single 21" shelf width, direct mounted (wall), catalog number IWD21S; all components to be stainless steel.
- h. Stainless steel rod shall be a 1.25" diameter stainless steel rod, anchored to wall on both sides with stainless steel holder.

2.4 FLAMMABLE CHEMICAL STORAGE CABINETS: (TCSCxxyy)

NOTE: Item is OFOI and specification is provided for Owner's Benefit

A. General:

- 1. Applicable to freestanding cabinets where shown on lab plans.
- 2. Flammable Chemical Storage Cabinet performance requirements shall be as previously noted for painted steel casework.
 - a. Maximum internal temperature: 325°F, when subjected to a 10 minute fire test using standard time-temperature curve per ASTM E152-72 (Article 42, NFPA No. 30).
 - b. Reference Standards:
 - 1) OSHA General Industry Standards Section 1910.106.
 - 2) NFPA Flammable and Combustible Liquid Code No. 30.
 - 3) Cabinets shall be Factory Mutual (FM) approved.

B. Flammable Chemical Storage Cabinets: Cabinets shall be specifically designed for the storage of flammable and combustible liquids. Construction shall be based upon the requirements listed by UFC, 18 gauge steel and shall be all double panel construction with a 1-1/2" air space between panels. Provide stainless steel construction when flammable chemical storage cabinets are next to stainless steel cabinetry. All joints shall be welded, or screwed, to provide a rigid enclosure. The doors shall swing on full-length stainless steel piano. The right hand door shall be equipped with a three point latching device and the left- hand door shall have a full height astragal. The doors are self-closing and synchronized so that both doors will always fully close. The right hand door is equipped with a three-point latching system that automatically engages when the doors close. Each door is equipped with a fusible-link hold-open feature that will ensure the door closes should the temperature outside the cabinet exceed 165 degrees Fahrenheit. A 2" deep liquid tight pan that covers the entire bottom of the cabinet shall be furnished to contain liquid leaks and spills. The shelf shall be perforated to allow air circulation within the cabinet. The cabinet shall have interior finish same as exterior. The unit shall be UL listed.

- 1. Top, bottom and sides: 18 gauge steel, double wall construction with 1-1/2" air space, removable access and back panels; all joints welded. Set bottom of door two inches above bottom of cabinet to create two-inch deep well to contain spillage of liquids.

Hardware:

- a. 3 point latching device and lock
- b. Full length piano hinge
- c. Door operation: Self-closing with fusible link
- 2. Upper and Lower Arrestor Vents with Spark Screens: Factory Mutual approved vents located so that they can be plugged both internally and externally to assure isolation of stored fluid, but can be opened for ventilation means as required by applicable local codes.
- 3. Cabinet Grounding Attachment: Screw at base of cabinet for firm attachment of grounding wire.

4. Cabinet Color and Markings:
 - a. Cabinet color and markings shall be selected from the manufacturer's standard colors.
 - b. Mark with Factory Mutual approval.
 - c. Label cabinet: "FLAMMABLE – KEEP FIRE AWAY"
 5. Shelving: Provide with two (2) adjustable shelves at tall cabinets.
- C. Grounding: All cabinets shall be grounded.
- D. Finish: Powder coated or urethane. Color selected from manufacturer's color line.
- E. Size:
1. Tall Flammable Chemical Cabinets: 45 gallon capacity, 18" deep x 43" wide x 65" tall.

2.5 NARCOTICS CABINET: (NARCx-1)

- A. General:
1. Applicable to wall mounted cabinets where shown.
 2. Size: As shown on drawings x 13" deep.
- B. Shelving: Provide with three full width adjustable shelves.
- C. Double Locking System: Inside lock keyed separately from outside lock; key is removable only when door is locked.
- D. Finish: Match laboratory casework in color and finish.

2.6 MOBILE TABLES

- A. Tables: Mobile, adjustable height table configurations:
1. General requirements for tables:
 - a. Work surface support frame: 11 gauge cold rolled steel tubing. Cabinet support channels: 14 gauge cold rolled steel. Weld members using the inert gas process.
 - b. Support arms:
 - 1) Cantilever support arms: 11 gauge cold rolled steel.
 - 2) 4 leg adjustable height support arms: 11 gauge cold rolled steel.
 - c. End caps: Flame resistant ABS plastic, color matched.
 2. Finish: Chemical resistant powder paint finish in manufacturer's standard color to be selected and coordinated with Architect's interior designer.
 3. Design: The mobile table design is indicated in the drawings.
 4. Location: Locations of mobile tables are indicated in the drawings.
 5. Mobile Adjustable Height Table Construction:
 - a. Freestanding table capable of supporting suspended base cabinets. Rectangular and 90 degree corner configurations.

- b. Structural modesty panel: Box construction of 18 gauge cold rolled steel.
 - c. Leg upright: 16 gauge cold rolled steel.
 - d. Feet: Die cast aluminum.
 - e. Table weight: Maximum weight of table assembly: 400 pounds.
 - f. Design weight capacity: Table weight plus 600 pounds.
 - g. Tables include four-leg, structural and extended frame configurations.
 - h. Provide a spring loaded pin with holes set at 2" increments at each table leg to adjust the mobile table height.
 - i. Provide mobile tables with four 6" diameter, swiveling rubber wheels, each with foot operated locking mechanisms.
6. Table Frames:
- a. Table frames: 4-1/2" high "C" channel front and back aprons, end rails and cross rails.
 - b. Table drawers: Provide front and back rails; drawer unit, hardware and suspension same as specified for base unit drawers.
 - c. Legs: 1-1/2" x 1-1/2" steel tube legs with welded leg bracket. Attach legs with two bolts to front and back aprons and weld to end rails. Provide adjustable height legs to enable the table height to be placed at heights ranging from 28" to 36" at maximum of 2" increments.
 - d. Knee space frames: 2" high apron where no drawers are required (shall satisfy ADA requirements for undercounter clearance at 32" high countertops).
 - e. Leg rails and stretchers: Channel formed.

2.7 LABORATORY SINKS

- A. Provide laboratory sinks complete with overflows, sink outlets and tailpieces. P-Traps, supplies and valves to be provided by Division 22, plumbing subcontractor. All connections shall be by Division 22. Lab sinks are indicated in the lab casework floor plan drawings.
- B. Stainless steel sinks: Type 316 stainless steel, No. 4 polish. Provide in 16 gauge material.
- C. Provide 1/2" radius cove at vertical and horizontal corners and pitch bottom to drain plug. Electrically weld, grind and polish smooth all joints rendering joints seamless. Apply heavy mastic type sound deadening coating to underside. Include crumb cup strainer with tailpiece.
- D. Size: Reference Lab Sink Schedule on sheet L-001.
- E. Drain location: Center at standard sinks or center-rear as needed at ADA sinks.
- F. Sink Supports:
 - 1. Cabinet sinks: Support sinks on 11 gauge, adjustable, 1" x 2" x 1" channel with reagent resistant finish. Provide two channels across width of cabinet, attached to 3/8" diameter threaded hanger rods.

2.8 LABORATORY PLUMBING & ELECTRICAL FITTINGS

- A. General:

1. Products shall be Watersaver – Colortech series or other manufacturers listed in Section 2.1, or other equal products manufactured by other manufacturers. Minor differences from these specifications in the design, manufacturing techniques and appearance of the products offered by the approved manufacturers are acceptable.
2. All fixtures shall be warranted for a period of two years after date of occupancy. All laboratory service fixtures shall be the product of one service fixture manufacturer to ensure uniform appearance and ease of maintenance.
3. All service fittings shall be factory assembled (including the assembly of valves and shanks to turrets, flanges and other mounting accessories), and each fixture shall be individually factory tested. All fixtures shall be designed to minimized exposed surfaces on which dust, dirt and airborne contaminants may collect, and to facilitate cleaning and maintenance of the service fixture. Faucet and valve handles shall be hooded to cover the valve stem and top surface of the packing nut or bonnet. The valve stem shall not be exposed to view as the faucet or valve is opened and closed.
4. Installation: Lab casework contractor shall furnish all laboratory plumbing and electrical fittings specified, but these shall be turned over to the Division 22, 23 and 26 contractor for installation.

B. Finish:

1. Chrome: All laboratory service fittings and emergency eyewash and shower equipment shall be furnished with a chrome-plated finish with clear epoxy coating. All exposed surfaces shall be polished and buffed, then electroplated with one layer of nickel and one layer of chrome. Following plating, clear epoxy coating shall be applied to all exposed surfaces and then baked to permit curing. Surfaces shall have a minimum thickness of 2 mils.

2. Performance: All coating material shall meet the following tests for chemical resistance:

- a. Fume test: Suspend coated samples in a container at least 6 CF capacity approximately 12” above open beakers, each containing 100 cc of 70% nitric acid, 94% sulfuric acid and 35% hydrochloric acid, respectively. After exposure to these fumes for 15 hours, the finish on the samples shall show no discoloration, disintegration or other effects.

- b. Direct application test: Subject coated samples to the direct action of the following reagents and solvents at a temperature of 25°C dropping from a burette at a rate of 60 drops per minute for 10 minutes.

Acetone, Carbon Tetrachloride, Ethyl Alcohol, Glacial & Acetic Acid	99.5%
Hydrochloric Acid	38%
Mineral Oil, Nitric Acid	70%
Sodium Hydroxide	50%
Sulfuric Acid, Toluene & Zinc Chloride-Saturated	92%

Finish on samples shall not rupture, though slight discoloration or possible softening is possible.

C. Water Service Fittings: Provide deck mounted plumbing service fittings at laboratory sinks as follows:

1. Provide deck mounted mixing faucet with deck mounted 4” blade handles and 8” swinging goosenecks with vacuum breakers. Provide model # CT2224-8VB with integral vacuum breaker as manufactured by Watersaver-Colortech, or other manufacturers. Provide standard aerator type of fitting on each faucet. The water faucets and valves shall be fully assembled and individually tested at the factory. Fixtures shall be factory tested at 100 psi to withstand 80 psi working pressure. Water service faucets and valves shall have renewable unit containing all working parts subject to wear, including replaceable stainless steel seat. All water service fixtures shall meet the

requirements of ANSI/ASME A112.18.1M-1989 and be certified by CSA under standard CAN/CSA B.125.M89.

2. Goosenecks shall have a separate outlet coupling with a 3/8" IPS female thread securely brazed to the gooseneck for attachment of serrated hose ends, aspirators and other outlet fittings. Provide each rigid gooseneck with standard aerator type of fitting installed on each faucet. Additionally, provide one loose 3/8" IPS male inlet thread that the Owner can use in the future to be threaded directly into the faucet.
3. Provide vacuum breakers integral with the gooseneck. Vacuum breakers shall have a forged brass body, a renewable seat and an ultralight float cup with a silicone gasket for fine flow control. Vacuum breakers shall not spill over at low water volume. Vacuum breakers shall be certified by ASSE under standard 1001.
4. Handles: All water fittings shall be provided with separate deck mounted faucets with horizontal acting wrist blade handles conforming to ADA Accessibility Standards. Faucet design shall be compatible with the foot pedal water delivery system specified in this section.
5. Hands-Free Fittings as Scheduled: Faucets shall be provided with hands free infrared operation, at locations as indicated in the Laboratory Sink Schedule.
 - a. Infrared operated faucets: Provide model # CT4544-8VB55BH as manufactured by Watersaver-Colortech, with transformer that plugs into an electrical outlet under the counter, or equal products by other manufacturers. Refer to plumbing drawings for plumbing work associated with piping. All sinks with hands free devices shall also have standard faucets to enable persons to manually adjust hot and cold water temperature. Lab casework manufacturer shall coordinate and prep all casework as required for the installation of foot pedal fittings and plumbing. Deck mounted water fittings with the infrared operation shall match the appearance of those at other locations. Provide with deck mounted 4" blade handles and 8" goosenecks with vacuum breakers and standard aerator.

D. Combination Emergency Eyewash / Shower Units (EWS):

1. Combination emergency shower / eyewash units:
 - a. Swing Down Recessed eyewash and emergency showers with eyewash drain pan: Watersaver model # SSBF2150 SS finish with chrome plated brass construction including top extension and shower head, where swing down units are called for, **pipe eyewash pan drainage to fully concealed sanitary waste system. Do not discharge eyewash on to floor!**
2. Provide units where shown in the lab drawings. All units shall comply with ADA for handicap accessibility. Provide all signage required by ANSI and OSHA. Water flow from units shall comply with ANSI Z358.1. Unit shall be capable of being operated by both hand and foot devices.
3. Body shower component of the combination shower/eyewash shall provide sufficient flow with correct dispersion. The operating system is to be a stay -open-ball-valve with rod operation. The ball valve is to be replaceable without dismantling the entire shower. Each shower shall be supplied with an international approved emergency symbol for easy identification as required by the Federal Occupational Safety and Health Administration. Showers to be tested at a minimum pressure of 100 psi before leaving the factory. The base floor flange shall have 3 holes for secure mounting. Provide tailpiece assembly for the eyewash drain outlet, sized and configured to drain into the floor drain, and constructed of material matching the eyewash/shower unit.
4. Eyewash component of the combination shower/eyewash unit shall have a self-regulating flow control, a filter to remove debris from the water, and an integral flip-top dust cover. The operating system is to be a hand activated push "stay-open-ball-valve". Eye washes to have a built-in ball valve or to be provided with a loose ball valve for correct flow regulation.
5. All mixing valves shall be provided by Division 22.

6. Waste connections for EWS are concealed in wall.
7. Provide a chrome-plated tailpiece at the base.

E. Deck Mounted Drench Hose Eyewash Units (EW):

1. Watersaver model # CTEW1022BP (@ right hand of sink). Provide deck mounted drench hose eyewash units at lab sinks, where indicated, with in-line vacuum breaker. Unit shall have 2 gentle spray outlet heads. Provide all signage required by ANSI and OSHA. The design of these units and their water flow, shall comply with ANSI Z358.1 for dedicated eyewash equipment. All mixing valves shall be provided by Division 22.
2. Locate eyewash unit on right hand of sink, rotated 45° towards sink.

F. Color Coded Handles for Service Fittings, Faucets and Controls: Provide faucet and service fittings with color coded hooded handles, with entire removable screw-on type plastic discs with letter stamped on disc in contrasting color as scheduled below:

	SERVICE	HANDLE COLOR	DISC LETTERS
1.	Cold Water	Dark Green	CW
2.	Hot Water	Red	HW

G. Electrical Fixtures and Fittings: Lab casework manufacturer shall coordinate location of and prep all casework for installation of multi-outlet assemblies and other electrical work specified under Division 26. All electrical work shall be by the electrical subcontractor. Material and installation shall be in strict adherence with the current edition of the National Electric Code of the National Fire Protection Association, and with requirements of all local regulatory authorities. All outlets must be grounded.

1. Flush boxes: Galvanized steel, for duplex outlets.
2. Task Lights: Specified by Division 26, provided by electrical contractor and delivered to the laboratory casework installer for on-site setting of fixture to underside of upper cabinetry. All wiring to be performed by the electrical contractor as specified by Division 26.

2.9 BUTCHER PAPER DISPENSER (PRD_x) x = Length on plans

- A. Provide and install undercounter butcher paper dispensers where shown on the drawings. Dispensers shall accommodate a roll of standard white butcher paper. Provide dispenser size (width) as called for on the drawings. Dispenser shall be all steel construction and shall include paper roll rod and steel cutting edge across the full width of the dispenser. Cutting edge shall be spring loaded, keeping the cutting edge in contact with the butcher paper roll regardless of the amount of paper on the roll. Provide 2 rolls of paper with each dispenser.
- B. Manufacturer: Bulman, Model# A-520, or equal manufacturer. Provide units for undercounter mounting applications shown including but not limited to undercounter mounting at mobile tables and fixed counters.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Verify all equipment rough-in conditions and requirements.

- B. Coordinate with other trades for the proper and correct installation of plumbing and electrical rough-in, structural backing for items attached to walls and for rough opening dimensions required for the installation of products in this section.
- C. Examine substrate surfaces and associated work and conditions under which work will be installed. Do not proceed until unsatisfactory conditions have been corrected in a manner complying with the Contract Documents and acceptable to the Installer. Starting of work within a particular area will be construed as installer's acceptance of surface conditions.

3.2 INSTALLATION

A. General Requirements:

- 1. Install in accordance with manufacturer's instructions.
- 2. Install in accordance with standards required by the governing codes.
- 3. Sequence installation to ensure utility connections are achieved in an orderly and expeditious manner.
- 4. Touch-up minor damaged surfaces caused during installation. Replace damaged components as directed by Architect.
- 5. Equipment in this section shall be installed with all necessary fittings mounted for final connection by Divisions 22, 23 and 26.

B. Casework Installation:

- 1. Install plumb, level, true and straight with no distortions. Shim as required, using concealed shims. Where laboratory casework abuts other finished work, scribe and apply filler strips for accurate fit with fasteners concealed where practical.
- 2. Base cabinets: Set cabinets straight, plumb and level. Adjust set tops within 1/16" of a single plane. Fasten each individual cabinet to floor at toe space, with fasteners spaced 24" o.c. Bolt continuous cabinets together with joints flush, tight and uniform, and with alignment of adjacent units within 1/16" tolerances. Secure individual cabinets with not less than 2 fasteners into floor, where they do not adjoin other cabinets.
- 3. Secure wall cabinets to solid supporting members, such as wall studs with concealed wall blocking, CMU, etc.
- 4. Abut top edge surfaces in one true plane. Provide flush joints not to exceed 1/8" between top units.

C. Countertop Installation (non-stainless steel):

- 1. Where required due to field conditions, scribe to abutting surfaces.
- 2. Field jointing: Only factory prepared field joints, located per approved shop drawings, shall be permitted. Secure joints in field, where practicable, in same manner as in factory, with dowels, splines, adhesives, or fasteners recommended by manufacturer. Locate field joints as shown on accepted shop drawings, factory prepared so there is no jobsite processing of top and edge surfaces.
- 3. Secure work surfaces to casework and equipment components with material and procedures recommended by the manufacturer.
- 4. Fastenings: Use concealed clamping devices for field joints. Tighten in accordance with manufacturer's instructions to exert a constant, heavy clamping pressure at joints. Secure tops to cabinets with "Z" type fasteners or equivalent, using 2 or more fasteners at each front, end, and back.

5. Flatness: All installed counters shall have a flatness of no more than 1/16" per 6 linear feet of run. All counters shall be examined for flatness prior to installation and those that cannot meet this level of flatness shall be replaced by the contractor. Shims shall not exceed 1/8".
 6. Workmanship: Abut top and edge surfaces in one true plane, with internal supports placed to prevent any deflection. Provide flush hairline joints in top units using clamping devices. At joints, use manufacturer's recommended adhesives and holding devices to provide joint widths not more than 1/16" wide at any location, completely field and flush with abutting edges.
 - a. After installation, carefully dress joints smooth, remove any surface scratches, clean and polish surface.
 - b. Provide holes and cutouts as required for mechanical and electrical service fixtures.
 - c. Provide scribe mountings for closures at junctures of top, curb and splash with walls as recommended by manufacturer for materials involved. Use chemical resistant, permanently elastic sealing compound where recommended by manufacturer.
- D. Sink Installation:
1. Sinks which were not factory installed shall be set in chemical resistant sealing compound and secured and supported per manufacturer's recommendations.
- E. Accessory Installation: Install accessories and fittings in accordance with manufacturer's recommendations. Turn screws to seat flat; do not drive.

3.3 ADJUSTING

- A. Adjust operating equipment, with the exception of air-moving equipment, to efficient operation for its intended use, and as required by the manufacturer.
- B. Make final adjustments to laboratory casework, including doors, drawer hardware, fixtures and other moving or operating parts to ensure proper and smooth operation.
- C. Adjust fixtures, accessories and other moving or operating parts to function smoothly.

3.4 CLEANING

- A. Clean equipment, casework, countertops and all other surfaces as recommended by the manufacturer, rendering all work in a new and unused appearance. Touch up as required.
- B. Clean adjacent construction and surfaces which may have been soiled in the course of installation of work in this section.
- C. Clean countertops with diluted dishwashing liquid and water leaving tops free of all grease and streaks. Use no wax or oils.

3.5 PROTECTION OF FINISHED WORK

- A. Provide all necessary protective measures to prevent exposure of equipment and surfaces from exposure to other construction activity.
- B. Advise general contractor of procedures and precautions for protection of material and installed equipment and casework from damage by work of other trades.

END OF SECTION 12 35 53

SECTION 13 21 26 - COLD ROOMS

PART I - GENERAL

1.1 SCOPE OF WORK

- A. Furnish and install recessed walk-in refrigerated room assemblies, complete with all associated equipment, switches, evaporators, valves, defrost equipment, receptacles, lights, conduit, wire, piping, materials, components, systems, etc., and other appurtenances and assemblies as required for a complete operating system.
1. The walk-in refrigerated room manufacturer shall provide the above assembly prewired to a junction box (junction box by Division 26) in wall above the refrigerated / freezer rooms.
 2. The walk-in refrigerated room manufacturer shall provide the above assembly pre-plumbed to locations that shall be determined in the field through coordination between the manufacturer and related trades.
- B. Work included (Contractor Furnished Contractor Installed):
1. Main Cooler / 115 **ME8**
 2. Decomp Cooler / 123 **ME9**

1.2 RELATED DOCUMENTS: The completion of the work described in this Section may require work in or coordination with other Sections of these specifications. The Contractor and the subcontractor will be responsible for a complete installation of the work described in this Section. These related sections include, but are not limited to the following:

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specifications apply to this Section.
- B. Refer to Divisions 22, 23 and 26 and the mechanical and electrical drawings for related work
- C. System commissioning is part of the construction process. Documentation and testing of systems, as well as training of the Owner's operation and maintenance personnel is required in cooperation with the Commissioning Consultant. Substantial Completion is dependent on successful completion of all commissioning procedures, documentation and issue closure. Refer to Commissioning of Systems Specification in Division 1 for detailed commissioning requirements.

1.3 QUALITY ASSURANCE

- A. Single source responsibility: All systems and components which comprise the walk-in refrigerated rooms shall be designed, fabricated and assembled by a single manufacturer.
- B. Manufacturer's qualifications: Modern plant with proper tools, dies, fixtures and skilled workers to produce high quality walk-in refrigerated rooms, and shall meet the following minimum requirements:
1. Five years or more experience in the manufacture of the specified product.
 2. Installers shall be factory certified by the manufacturer.

- C. Coordination: The supplier / installer shall coordinate the installation of all products under this section and shall coordinate the installation and rough-in sizes and locations for all utilities required for walk-in refrigerated rooms. The manufacturer shall coordinate all electrical requirements with the electrical contractor.
- D. Architect may wish to inspect products at the manufacturer's factory prior to shipment. Products found not to be in conformance with requirements of the contract documents may be rejected.
 - 1. Company Field Advisor: A company field advisor shall be on site supervising installation of the walk-in coolers , including all equipment necessary for the proper operation of the walk-in unit. This person shall be an employee of the manufacturer. Additionally, the field advisor shall be certified in writing by the manufacturer to be technically qualified in the design, installations, and servicing of the required products. Installers: Installation of the equipment specified under this section shall be undertaken by the manufacturer's crew of installers, or a crew of installers who are approved in writing by the manufacturer. In either case, the installation of equipment specified under this section shall remain the responsibility of the manufacturer as a subcontractor to the general contractor.
- E. Each walk-in unit shall be classified by Underwriter's Laboratory, Inc. and approved by Factory Mutual. All electrical components shall also be UL listed.
- F. Install all equipment in accordance with the National Electric Code and the Electrical drawings and specifications.
- G. Agency Approvals: All work shall comply with National Sanitation Foundation Standard No. 7. The NSF label shall be affixed to the interior door pans. Interior corners and floor shall be coved to meet NSF specifications. The panels shall be UL listed with a fire hazard classification according to ASTM E-84. The panels shall be certified with UL label.

1.4 DELIVERY, STORAGE AND HANDLING

- A. Deliver, store, protect and handle products on the site in such a manner as to minimize the risk of damage, decay, deterioration or loss from theft.
- B. All products shall be delivered to the job site in manufacturer's original unopened containers, crates or protective wrappings with the manufacturer's name and address clearly labeled thereon.
- C. Accept products on site and inspect on arrival for damage.

1.5 SUBMITTALS

- A. General: Submit the following in accordance with Conditions of the Contract and Division 1 Specification sections.
- B. Product Data: Manufacturer's catalog sheets, specifications, utility and service requirements and locations, and installation for each item specified.
- C. Quality Control Submittals:
 - 1. Company Field Advisor Data:
 - a. Name, business address and telephone number of Company Field Advisor secured for the required services.

- b. Certified statement from the Company listing the qualifications of the Company Field Advisor.
 - 2. List of Completed Installations: If brand names other than those specified are proposed for use, furnish the name, address and telephone number of at least four (4) comparable installations which can prove the proposed products have performed satisfactorily for five (5) years.
 - D. Shop Drawings: Provide two (2) electronic copies in PDF format of drawings showing wall and ceiling panel layout, light fixture layout, door locations, locations for recessed control panels, floor recess depth, monitoring devices, electrical diagrams, etc. Include all applicable details for fabrication and erection, including panel, door, door hardware and electrical panels.
 - E. Structural Calculations: Submit structural calculations, including seismic design, lateral and vertical load calculations required by governing codes and authorities having jurisdiction, prepared and sealed by a structural engineer licensed in the state of the project, for review by the project structural engineer. This structural engineering shall include the necessary reinforcement within the refrigerated room walls, floors and ceilings required for support and anchorage of all cooler equipment items imposing live and dead loads on the cooler structure, negative pressure outside the cooler, seismic design and other requirements of this specification.
 - F. Guarantee: In addition to the General Contractor's guarantee for all work, furnish an additional guarantee for a period of five years after acceptance of the work that each walk-in unit will furnish the full range of temperatures specified. Make all repairs as required and replace all equipment as required to meet this guarantee.
 - G. Contract Closeout Submittals: Provide two (2) electronic copies in PDF format as required by General Conditions.
 - H. Operation and Maintenance Data: Provide two (2) electronic copies in PDF format, covering the installed products to the Architect.
- 1.6 COORDINATION
- A. Verify that field measurements are as indicated on shop drawings or as instructed by the manufacturer. Coordinate final openings, sizes and electrical and plumbing utility rough-in sizes and locations with the appropriate trades.

PART 2 - PRODUCTS

2.1 ACCEPTABLE PRODUCTS

- A. Subject to compliance with these specifications, provide products as manufactured by Mortechn Manufacturing: 411 North Aerojet Avenue, Azusa, CA 91702; www.mortechmfg.com, (800) 410-0100, or equal products from other manufacturers pre-approved in writing prior to bid submission.

2.2 MATERIAL

- A. General Requirements: Furnish and install complete recessed walk-in refrigerated room unit, including insulated panels, refrigeration compressor, controls and all accessory components necessary for complete and operations refrigerated room. System and components shall be manufactured by a company with at least five (5) years' experience in the design and production of walk-in refrigeration systems.

1. Walk-in Refrigerated Cooler Room - **Main Cooler / 115** (Equipment Number **ME8**):
 - a. Size (inside dimensions): 24'-0" x 17'-0"
 - b. Ceiling Height (inside dimension): 10'-0"
 - c. Door Size: 48" w x 84"h, hinged
 - d. No insulated panel floor required.
 - e. Condensing Unit: (2) Larkin LHT032X6B
 - f. Evaporator Coils: (2) Larkin LCA6260AB (1 per system)
 - g. Desiccant Dryer: (1) Munters Model HC-150
 - h. Ventilation: 150 CFM supplied to cold room from dehumidifier system with inline filter system, 150 CFM returned back to dehumidifier system.
 - i. Security:
2. Walk-in Refrigerated Cooler Room - **Decomp Cooler / 123** (Equipment Number **ME9**):
 - a. Size (inside dimensions): 16'-8" x 14'-0"
 - b. Ceiling Height (inside dimensions): 10'-0"
 - c. Door Size: 48" w x 84"h, hinged
 - d. No insulated panel floor required.
 - e. Condensing Unit: (2) Larkin LHT030X6B
 - f. Evaporator Coils: (2) Larkin LCA6260AB (1 per system)
 - g. Desiccant Dryer: (1) Munters Model HC-150
 - h. Ventilation: 150 CFM supplied to cold room from dehumidifier system with inline filter system, 150 CFM returned back to dehumidifier system.
 - i. Security:
 - j. Wire Partition fence with gate as shown on floor plan (**Add Alternate**).

B. Refrigeration System: All rooms shall be provided with mechanical cooling systems as specified herein. The refrigeration system shall be an integral part of the control and conditioning system. Compressor / Condensing units shall be located as indicated on the contract drawings and shall be suitable for outdoor operation.

1. Redundant Systems: Provide identical redundant systems with automatic switchover devices, which will automatically switch from one system to the other and back at programmed intervals. The switchover device shall be automatically activated when one operating system malfunctions and as indicated elsewhere in this specification.
2. System shall be Scroll or Hermetic industrial type designed. Include all components necessary to accomplish effective, efficient, serviceable installation. System shall consist of, but not be limited to, scroll or hermetic compressor, receiver, air cooled condenser, evaporator, moisture indicating sight glass, liquid filter-drier, dual pressure controls, crankcase pressure regulator, suction accumulator, suction line filter, liquid and hot gas solenoid valves, expansion valve, oil level sight glass, manual shut-off valves, condenser head pressure control valve (flooded condenser type) and all integral piping and wiring system shall be capable of operating at low ambient temperature.
3. Separate and independent air-cooled refrigeration systems shall be provided for each walk-in unit. The manufacturer/supplier shall calculate and provide the proper size of compressors and blower coils based on loads determined from the drawings in terms of number of items stored,

performance requirements of this specification and normally expected usage of walk-in units in a lab facility.

4. Compressors shall be Mezzanine or roof mounted. Refer to plan drawings for locations.
5. Locate condensers/condensing units on the mezzanine or roof. Verify exact locations with Architect and Contractor. Refer to electrical drawings for the size and type of circuit breakers required for each walk-in unit. Make all necessary attachments to the building structure for installation of equipment and provide all required interfacing steel. Submit details in submittal package. Roof curb / Housekeeping pad or condenser rack by others.

C. Temperature Requirements:

1. Refrigerated Rooms: Operating temperatures shall be maintained in range as indicated:
 - a. Refrigerator: Uniform temperature shall be maintained throughout at plus or minus 2 degrees F. Critical alarm temperature range settings are 34 to 44 degrees F.

D. Panels: Standard wall and ceiling panels shall be 2-feet and 4-feet in width and shall be interchangeable with like panels. Corner panels shall be 90-degree angles with 12" exterior horizontal measurements. 1-foot and 3-foot wide panels and 12" x 6" corners may be used if required to meet job site conditions.

1. Panel Construction: Foamed-in-place urethane insulation sandwiched between interior and exterior metal skin, which has been die-formed and gauged for uniformity in size. Edges of panels shall be foamed-in-place tongue and groove with locking devices foamed-in-place at time of fabrication.
2. Metal Skin Material:
 - a. Exterior walls: 26-gauge stucco embossed steel with baked enamel [steel] finish, [and 22-gauge type 304 stainless steel with #4 finish where exposed to view.]
 - b. Interior walls: 22-gauge polished stainless steel with #4 finish.
3. Insulation: Each panel shall be completely filled with CFC free rigid foamed-in-place urethane with the following physical characteristics:
 - a. Thermal conductivity (K factor): 0.14 BTU/hr/sq. ft./degrees F/inch.
 - b. Overall coefficient of heat transfer (U factor): Not more than 0.030.
 - c. R factor: 30.
 - d. Closed cell structure: 97%.
 - e. Average in-place density: 2.3 lbs./cu.ft.
 - f. Compressive strength at yield point: 18 lbs/sq. in.
 - g. Overall thickness: 3.5-inches for framed panels, 4" for frameless panels.
 - h. Fire hazard classification: ASTM E-84.
 - i. Underwriters Laboratory label: UL-723.
 - j. Flame spread rating: 25 or less.
 - k. UL Listed.
 - l. Toxicity Rated.
 - m. Factory Mutual or UL approved
4. Locking Assembly: Assembly of panels shall be accomplished by cam-type locking action. Cam-type lock shall be foamed-in-place and activated by a hex wrench provided by the manufacturer.

Access ports to the locking devices shall be provided from the interior to allow assembly of the unit from the inside. Access ports to locking devices shall be covered by snap caps.

5. Panel section gaskets: Shall be NSF listed. On frameless panels, vinyl gaskets shall be foamed in place on the interior and exterior edges of the tongue rails. On framed panels, closed cell foam gaskets shall be applied to the interior and exterior edges of the tongue rails. Gaskets shall be impervious to stains, greases, oil and mildew.
6. Provide reinforcement within cooler walls, floors and ceilings required for support and anchorage of all cooler equipment items imposing live and dead loads on the cooler structure, other items anchored to panels, design, negative pressure outside the cooler, required seismic design and other requirements of this specification.
7. Ceiling Panels: Main body cooler will require a self-supported ceiling. Ceiling panels are to be 5" thick and "I beam" support to be no taller than 9" with a maximum of 12" of clearance for installation.

E. Entrance Door and Panel (Hinged Doors where indicated on plan drawings):

1. General requirements and construction: Doors shall be stainless steel flush type entrance doors, manually operated side-hinged, with swings as shown on the drawings. Door opening size: **4'-0" wide x 7'-0" tall**. Door shall be finished in stainless steel inside and out. Thickness and finish of stainless steel and thermal characteristics of the insulated door shall match the cooler wall panel construction. All doors shall be listed by Underwriters Laboratories, and be equipped with the following:
 - a. Hardware: Equip each door with magnetic gasket to form an airtight seal at the sides and top of door. Provide an adjustable sweep gasket at the bottom edge of the door. Hardware shall include keyed locks from the adjacent spaces for security and a panic safety release from the interior to prevent entrapment of personnel within the unit (also refer to other special features below). Provide polished chrome, strap type, cam-lift hinges. Gasket shall be dual blade flexible wiper type to form a tight seal. Gaskets shall be replaceable, resistant to oils, fats, water and detergents, and shall be NSF approved. Hinges shall be stainless steel, slow action, spring loaded self-closing and 3 per door.
 - b. Jamb: Door jamb and door perimeter shall be made of fiberglass reinforced or ABS plastic. An isolated, low wattage heater wire covered by magnetically attracting stainless steel shall be fitted onto this jamb. This shall provide perfect sealing of magnetic gasket and prevent frost and condensation build-up.
 - c. Each entrance door shall be provided with a LED type vapor proof light, switch with pilot light and interconnecting wiring harness. Concealed wiring shall be standard on each entrance door.
 - d. Manual Thermometer: Provide a manual thermometer with each door section to indicate inside air temperature in degrees F.
 - e. View panel: Provide insulating 14" x 14" triple glazed removable glass view lite, with heated frame.
 - f. Kick plate: Provide 16-gauge stainless steel kick plate on both sides of all doors to coolers. Kick plate to be 48" high by width of door.
 - g. Coordinate door construction with security contractor for card readers and mag locks where required. Refer to plan drawings for additional information. Card readers and mag locks to be furnished and installed by security contractor.
 - h. The door shall be wired to the building security system. Provide all provisions necessary to tie the doors into the building security system, including concealed conduit and all preparation to the doors, frames and cooler panels.

- F. Closure panels, trim strips, wall protectors: Furnish and install material to enclose the areas between the building and walk-in units at ceilings and walls. Panels shall be fabricated from the same materials as the walk-in unit panels.
- G. Wrap around jambs and heads: Furnish and install 16-gauge stainless steel plate closure panels formed to completely cover the jamb and head gaps that occur between the building wall and the cooler wall. Exposed edges of stainless steel closure members shall be rounded to avoid being a hazard.
- H. Wall Protectors: Provide hat shaped 16-gauge stainless steel bumper rails at all sides of cooler. Bumper rail shall be 1" deep x 5" high, located and installed by cooler manufacturer.
- I. Corner Guards: Provide 16-gauge stainless steel corner guards 6" x 6" x 60" high on all exposed exterior corners of walk-in refrigerated room.
- J. Base Cove: Provide base cove, where specified, to seal walk-in at building floors, inside and out, to facilitate easy cleaning. Base cove shall be constructed of 16-gauge stainless steel.
- K. Light fixtures at Cooler: Provide LED vapor proof light fixture, 48-inch long. Provide fixture layout sufficient to supply 40 foot-candles of illumination at 36-inches above the floor throughout the walk-in coolers. Fixtures shall be installed on the ceiling panels, and shall include an accessible junction box on the outside surface of the ceiling panel. Fixtures shall be UL listed for horizontal mounting in wet locations. Conduit and wiring shall be prewired, provided and installed by the cooler manufacturer as part of the walk-in refrigerated room assembly.

Materials:

- 1. Clear molded shatter proof high impact polycarbonate enclosure.
 - 2. 2-lamp, 36W, 0.3 amps, 2, 7773 lumens total output. 120VAC
 - 3. Luminaire: Rating IP-65 for wet and cold environments.
 - 4. Power for lighting: 110 VAC; provide 3-way toggle switches with pilot light to enable lights to be operated from both entries when applicable. (To be confirmed by refrigerated room manufacturer.)
 - 5. Voltage and other electrical characteristics shall be coordinated by the cooler manufacturer, electrical contractor and project electrical engineer.
 - 6. Safety light: Units shall be equipped with one 40W, vapor proof safety light fixture above each door.
 - 7. Switch and Pilot Light: A light switch with pilot light shall be located on the exterior of the cooler near the entry door.
- L. Refrigeration Equipment:
- 1. Design: Refrigeration system shall be designed and sized by the refrigerated room manufacturer, based on the following sizing parameters:
 - a. All system capacities shall be sufficient to meet simultaneously and continuously the following:
 - 1) Performance test requirements as specified in this section.
 - 2) Infiltration from 30 door openings per 24-hour period, 60 seconds each.
 - 3) Ventilation as specified in this section.
 - b. Refrigeration system: A completely integrated system consisting of an evaporator and condensing unit. Cooling output on demand proportioning basis in relation to the desired temperature control point.

- c. Defrost system: Units designed for operation above 2 deg C shall be provided with an air defrost system.
 - d. Defrost system: Units designed for operation below 1 deg C shall have an electric defrost system and shall include a 24-hour timer with fan delay. Defrost timer shall be time initiated and temperature terminated with built-in timer fail safe control.
 - e. Ventilation System & Dehumidification System: Provide supply and return stainless steel grilles with filtered blast gate dampers and ducted extensions out of cold room. Ventilation System shall have the cold room return air exiting the room to the process inlet of the dehumidifier system, with the cooler supply air entering the cold room from the process outlet side of the dehumidifier system, filtered by a desiccant dryer to remove humidity. A desiccant dryer system shall be provided for each refrigerated room by the refrigerated room manufacturer. Desiccant dryer systems shall be manufactured and designed by Munters, and sized to perform the required dehumidification function to achieve a constant relative humidity of 45% RH in each cooler. HVAC contractor to provide carbon filter, ducting to and from dehumidifier, ducting from reactivation exhaust side of dehumidifier system out building. Installation shall be coordinated with the HVAC contractor.
 - f. Dehumidifier system powered through the control panel.
 - g. Ambient interior building temperature (outside cooler): 80 degrees F.
2. Condensing Unit: Condensing units shall be scroll or hermetic type, air-cooled, factory assembled and UL listed. Provide all components necessary to accomplish effective, efficient, serviceable installation. Components shall be remote rooftop mounted on a heavy gauge steel base. Condensing unit rack shall be constructed of heavy gauge weather resistant metal angle, welded together, sized for the unit accommodated. Compressor mountings shall be preassembled, sized where shown on the drawings. On the low temperature systems, the time clock shall be included on the switch over system as described. Refrigerant lines shall be field supplied and installed. Design of the refrigerant system shall be based on the maximum run of 50 feet for the refrigerant lines (horizontally and vertically) to meet the requirements of the location where the equipment is installed in the building.
- a. System shall consist of, but not be limited to scroll or hermetic compressor, receiver, air cooled condenser, evaporator, moisture indicating sight glass, liquid filter-drier, dual pressure controls, suction accumulator, suction line filter, liquid and hot gas solenoid valves, expansion valve, oil level sight glass, manual shut-off valves, condenser head pressure control valve (flooded condenser type), and all integral piping and wiring system shall be capable of operating at low ambient temperature conditions.
 - b. Separate and independent air-cooled refrigeration systems shall be provided for each walk-in unit. The manufacturer/supplier shall calculate and provide the proper size of compressors and blower coils based on loads determined from the drawings in terms of number of items stored, performance requirements of this specification and normally expected usage of walk-in units in a lab facility.
 - c. Additional Requirements:
 - 1) Condensing unit assembly to have waterproof housing.
 - 2) Provide all necessary controls.
 - 3) Refrigerant, R404A, or as required by local codes.
 - 4) Size and type of circuit breakers are as shown on the electrical drawings.
 - 5) Make all necessary attachments to the building structure for installation of equipment and provide all required interfacing steel. Submit details in submittal package.
 - 6) Provide all piping from condensers to all related components.

- 7) Condensing units shall be designed by Heatcraft or approved equal.
3. Evaporator:
- a. Coils shall be sized to balance with the condensing unit.
 - b. Shall be made of plate type aluminum fins with copper tubes.
 - c. Shall have a drain pan with suitable drainpipe fitting.
 - d. Fan motors and coil shall be housed in a heavy gauge aluminum enclosure.
 - e. Evaporator shall have a drain pan with suitable drainpipe fitting.
 - f. Fan motor shall be ECM (Electronically Commutated Motor) type, in lieu of other types.
 - g. Evaporators shall be designed to a Heatcraft low/medium profile unit or equivalent.
4. Compressors:
- a. Locate condenser/condensing units on [a roof curb or housekeeping pad] [the mezzanine]. Verify location with Architect and General Contractor. Coordinate size and type of circuit breakers for refrigerated rooms. Make all necessary attachments to building structure and provide all interfacing steel for installation of equipment.
 - b. Compressor/Condenser system shall be high-efficiency design with extended condenser surface, and floating head pressure. Acceptable systems include Keeprite, Heatcraft or Russell.
5. Refrigeration Electrical Requirements: To be confirmed by refrigerated room manufacturer and as indicated on the electrical drawings.
- a. **Main Cooler / 115:**
 - 1) Condenser: 208-230V, 60 Hz, Single-phase, 40 amp circuit for each (separate redundant circuits for each of the redundant systems).
 - 2) Evaporator Coils: 110-120V, 60 Hz, single phase, 15 amp circuit for each (separate redundant circuits for each of the redundant systems). Power supplied by control panel.
 - 3) Electrical contractor is responsible for providing power per the requirements of the refrigeration equipment to a termination point at the Refrigeration Equipment Suppliers control panel and condensing units only. Refer to lab plans for location. The Refrigeration Equipment Supplier is responsible for providing all conduit, switches, lighting, wiring, disconnects and final electrical connections to all refrigeration equipment controlled by the Refrigeration Equipment Suppliers control panel.
 - b. **Decomp Cooler / 123:**
 - 1) Condenser: 208-230V, 60 Hz, Single-phase, 35 amp circuit for each (separate redundant circuits for each of the redundant systems).
 - 2) Evaporator Coils: 110-120V, 60 Hz, single phase, 15 amp circuit for each (separate redundant circuits for each of the redundant systems). Power supplied by control panel.
 - 3) Electrical contractor is responsible for providing power per the requirements of the refrigeration equipment to a termination point at the Refrigeration Equipment Suppliers control panel and condensing units only. Refer to lab plans for location. The Refrigeration Equipment Supplier is responsible for providing all conduit, switches, lighting, wiring, disconnects and final electrical connections to all refrigeration equipment controlled by the Refrigeration Equipment Suppliers control panel.

M. Automatic Switch-Over Device:

1. Shall consist of an electronic panel, which controls a dual mechanical system designed to provide temperature security in walk-in units. System shall incorporate the following features:
 - a. System back up based on heat load demand.
 - b. Equal wear time on condensing units and blower coils.
 - c. Protection from single condensing unit failure.
 - d. Situational warning lights for malfunction.
 - e. Replaceable component design.
2. Controls: Each system shall be mounted on the outside wall of the walk-in unit and shall be contained in a UL listed NEMA, Type 4 enclosure gasket required. Control box shall have an overlay of operating instruction on the front panel. Conduit chase cover required from control panel to finish structured ceiling. (See section "Other Special Refrigeration Room Design Requirements" may apply) Each system shall contain:
 - a. Temperature control sensor for thermostat control and reading.
 - b. Humidistat for humidity control and reading.
 - c. Cycle timer.
 - d. Alternating switching relay.
Blower coil pull-in relay. Relay (only supplied if programmed and controlled by control system and not by Time Clock)
 - e. Liquid Line Solenoid valve pull-in relay.
 - f. Pilot lights.
 - g. Digital temperature display.
 - h. Emergency shut down switch, which shall be labeled and readily available on the panel.
 - i. Door ajar feature to alarm by audio and visual feature.
 - j. Provide monitoring signals as follows for connection by the temperature control contractor:
 - 1) Normally open high temperature dry alarm contacts.
 - 2) Normally open low temperature dry alarm contacts.
 - 3) 4-20 milliamp retransmit signal for temperature.
 - 4) 4-20 milliamp signal RH.
 - 5) Normally closed emergency dry alarm contact.
3. Operation:
 - a. During the initial pull down the refrigeration system shall be in operation and the lead or lag system and System warning lights shall be on. After the recovery time has elapsed the system may go into alarm. Continue to mute system till set point is reached. Once set point is reached reset all alarm indicators.
 - b. Once the desired temperature is achieved, the lead or lag system light shall be on, and the other systems shall be in stand-by status.
 - c. Every 3-1/2 days, the control panel automatically switches the primary system with the backup system to allow for wear on both systems.

- d. If the primary system fails to maintain proper temperature the backup system shall be automatically set into operation, and the system warning light shall be lit. Only when the temperature is satisfied will the situation lights go back into normal operation.

N. Temperature Alarm Systems:

1. Primary surveillance center: Shall be incorporated in same panel, as switchover panel the center is to include the following:
 - a. Digital read out of room temperature.
 - b. Digital read out of RH.
 - c. Door ajar indicators.
 - d. Audible and visual alarms.
 - e. Audible defeat timers.
 - f. Temperature monitoring by 4-20 mA retransmit.
 - g. Humidity monitoring by 4-20 mA retransmit.
2. Alarm features: The alarm features are to include a digital read out for the room temperature at 6-foot. An audiovisual signal shall indicate a temperature above or below the specified ratings for each room. Control panel must provide a silence feature for audio portion of alarm. High, low and emergency dry contacts for notification to BMS. The alarm shall have a door ajar signal from each door.
3. Temperature and Humidity Monitoring-Recording Device: Control Panel must provide a 4-20 mA signal output for Owner's building monitoring system (BMS). Connection to output signal on control panel by others. Owners monitoring system is responsible for trending and recording of signal.
4. High/low temperature and emergency notification: Control Panel to provide dry contacts for Owner's BMS. Connection to dry contacts by others.

O. Other Special Refrigerated Room Design Requirements:

1. Refer to drawings for locations of refrigerated room control panels (Lab Accessory CPC).
2. Control Panel requires multiple circuits. Electrical contractor to coordinate with cold room installer for rough-in locations at control panels.
3. All conduit and wiring to cooler components shall be pre-wired by the walk-in refrigerated room manufacturer, run concealed within cooler panels or run above panels in ceiling or wall cavities. No exposed conduit is permitted to electrical fixtures. All concealed conduit inside of cooler panels shall be installed by the manufacturer.
4. Design all cooler ceilings to support a live load of 20 psf.
5. Coordinate location of condensate plumbing with plumbing contractor.
6. Seismic Restraints: The manufacturer / installer shall design and install the walk-in unit to resist seismic loading as required by the local governing codes. Provide all seismic details with submittal package indicating any required special wall construction, point loads, etc. Install all anchorage devices, including special legs and / or braces, required for seismic restraint of walk-in units to satisfy all governing code requirements for seismic anchorage of equipment.
7. Wire Partition Fence and Gate (**Add Alternate**): 10-gauge minimum galvanized chain link fence full height of interior cold room and not to exceed four inches below for security. Provide manual swinging door 7'-0" x 7'-0" with one swivel swing gate wheel located at the latch end of the gate to be located as shown on drawings.

P. Piping:

1. Tubing: ACR type. Hard drawn, cleaned and capped type L copper tubing soldered with silver solder, except for hot gas lines which shall be silver brazed. All lines shall be installed to allow for linear expansion of copper after startup.
2. Suction and Hot Gas Pipes: Size for velocity of 500-700 fpm on horizontal runs and show a slight pitch toward condensing unit. When condensing unit is located below evaporator and there is no possibility of trapping oil, size vertical runs. When condensing unit is located above evaporator, size vertical runs for velocity of 1000-1500 fpm.
3. Liquid Pipes: Size all liquid pipes for maximum 2 psig pressure drop.
4. Hangers: F&M ring type or Unistrut assemblies with appropriate tubing clamps to support liquid, suction and discharge pipes individually. Space supports [8 feet on center, maximum] [according to local codes].
5. Condensate Drain Piping: 7/8-inch outside diameter or greater Type [L] copper tubing piped from evaporators to open floor drain, rigidly support [at walls 5 feet on center] [according to local codes], maximum, installed in such a manner that leaves 1-inch clearance space between wall and drain. Floor drain to be located outside of cooler units. Adequately pitch toward floor drain and carry through wall of refrigerated areas properly trapped and discharge in floor drain.
6. Refrigerant Testing: Pressurize and leak test entire system at not less than 200 psig. Clean and dehydrate by maintaining a vacuum of 500 microns, or lower, for a 5 hour period.

Q. Insulation: Fire retardant "Armstrong" insulation, or approved equal, for insulating refrigeration suction and hot gas lines. Use minimum 3/4" thick wall for coolers. Apply during tubing assembly wherever possible.

R. Redundancy: All cooler units shall be provided with totally complete redundant mechanical systems with lead / lag timer. Refer to additional requirements for redundancy elsewhere in this specification.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Verify equipment rough-in before proceeding with the work in this section.
- B. Coordinate with other trades for the proper and correct installation of plumbing and electrical rough-in, structural backing for items attached to walls, and for rough opening dimensions required for the installation of products in this section.
- C. Examine substrate surfaces and associated work and conditions under which work will be installed. Do not proceed until unsatisfactory conditions have been corrected in a manner complying with the Contract Documents and acceptable to the Installer. Starting of work within a particular area will be construed as installer's acceptance of surface conditions.

3.2 INSTALLATION

- A. Install in accordance with manufacturer's instructions.
- B. Install in accordance with codes and standards required by authorities having jurisdiction.

- C. Anchor equipment securely in place. Comply with all seismic restrain code requirements for installation of walk-in units and associated equipment.
 - 1. Sequence installation to ensure utility connections are achieved in an orderly and expeditious manner.
 - 2. Sequence installation of the cold rooms with the flooring contractor prior to finish flooring installation.
 - 3. Inspect all floor, wall and ceiling conditions for trueness, to be level and plumb. Notify Architect of any unacceptable conditions. Do not proceed with installation until unacceptable conditions have been corrected. Proceeding with installation will be taken as acceptance of all conditions.
 - 4. Install all walk-in units plumb, true, neatly and securely. Install all doors to operate freely, without binding and to seal openings completely. Install all mechanical and electrical equipment to operate quietly, efficiently and without vibration to perform the intended function. Provide proper ventilation for all equipment. Install equipment for ease of inspection, service and maintenance.
- D. Touch-up minor damage of surfaces caused during installation. Replace damaged components as directed by Architect.
 - 1. Seal all cooler panel joints with a sealant approved by the cooler manufacturer.
- E. **After installation, epoxy terrazzo flooring material shall cure for a minimum of 14 days at a room temperature of 70°F ± 5°F prior to cooling the cold rooms to operating temperature. Cold room installer shall not cool the rooms at a rate greater than 5°F per hour to allow the flooring material to shrink at the same rate as the concrete substrate.**

3.3 CLEANUP, MAINTENANCE, ADJUSTING & DEMONSTRATION

- A. At completion, clean all surfaces thoroughly using no cleaners, which will harm adjacent surfaces.
- B. Protect all equipment and surfaces from damage and replace all damaged items.
- C. Adjust operating equipment to efficient operation for its intended use and as required by the manufacturer.
- D. Provide systems demonstration and demonstrate all equipment operations and functions.
- E. Refer to Commissioning Specification Section for training requirements for specific systems and equipment. Training of the Owner's operation and maintenance personnel is required in cooperation with the Commissioning Consultant. A training agenda shall be prepared by the Contractor and approved by the Owner prior to training performance.

END OF SECTION 13 21 26

