Project:

Sebastian River High School
Locker Room Remodel & Additions

Located at:

9001 Shark Blvd
Sebastian, FL 32958

PROJECT MANUAL / TECHNICAL SPECIFICATIONS

Prepared By:

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Architect's Commission Number
#040116VB

OWNER:

Indian River County School District
6055 62nd Ave
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DATE: 18 January 2017

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SECTION 01100 - DEFINITIONS

1.01 Except as specifically defined otherwise, the following definitions supplement definitions of the Contract, General Conditions, Supplementary Conditions and other general contract documents, apply generally to the work:

A. The term "Owner", or pronouns in place of same, where used in this Project Manual shall mean the individual or group for which work is to be performed under an agreement with the Contractor.

B. The term "Architect", where used in this Project Manual shall mean the firm of Edlund, Dritenbas, Binkley Architect's and Associates, P.A.

C. The term "General Contractor", "Contractor of Record", or "Contractor" where used in this Project Manual, shall mean the Contractor to whom the Contract for the work described and specified herein, and shown on the accompanying Drawings, has been awarded by the Owner.

D. The term "Subcontractor", or "Prime Subcontractor", where used in this Project Manual shall mean all other contractors operating under a contractual agreement for specific work on this project with the Contractor.

E. "Owner's Representative" shall mean that individual or individuals designated to represent the Owner in decisions effecting the work. The Owner's Representative will be designated prior to beginning of construction.

F. General Requirements: Provisions of Division / Sections of these specifications.

G. Indicated: Shown on drawings by notes, graphics or schedules, or written into other portions of contract documents. Terms such as "shown", "noted", "scheduled" and "specified" have the same meaning as "indicated", and are used to assist the reader in locating particular information.

H. Directed, Requested, Approved, Accepted, etc. These terms imply "by the Architect" of the Owner's Representative unless otherwise indicated.

I. Approved by Architect: In no case releases Contractor from responsibility to fulfill requirement of the Contract Documents.

J. Project Site: Space available to Contractor at location of project, either exclusively or to be shared with separate contractors, for performance of the work.

K. Furnish: Supply and deliver to project site, ready for unloading, unpacking, assembly, installation, and similar subsequent requirements.

L. Project Manual: As used in these Contract Documents includes the Bidding Requirements, Conditions of the Contract, and the Specifications.

M. Product: As used in these Contract Document includes materials, systems, and equipment.

N. Install: Operations at project site, including unloading, unpacking, assembly, erection, placing, anchoring, applying, working to dimension, finishing, curing, protecting, cleaning and similar requirements.

O. Provide: Furnish and install, complete and ready for intended use.

P. Installer: Entity (firm or person) engaged to install work, by Contractor, subcontractor or sub-subcontractor. Installers are required to be skilled experts in work that are engaged to install.

Q. Overlapping/Conflicting Requirements: Most stringent requirements apply and will be enforced, unless more detailed language written directly into Contract Documents clearly indicates that a less stringent requirement is acceptable. Where optional requirements are specified in a parallel manner, option is intended to be Contractor's unless otherwise indicated.

R. Minimum Requirements: Indicated requirements are for a specific minimum acceptable level of quality/quantity, as recognized in the industry.

S. The term "or equal" where used in the Project Manual shall in all cases mean an approved equal as determined by the Architect.

T. Contract Documents: shall consist of all plans, specs, bid documents, addendum, application form, permits, and any other documents accumulated in the performance of the construction of this project.

U. Substantial Completion: The Date of Substantial Completion of the Work or designated portion thereof, is the Date certified by the Architect when construction is sufficiently complete, in accordance with the Contract Documents, so the Owner can occupy or utilize the Work or designated portion thereof, for the use for which it is intended, as expressed in the Contract Documents.

V. The term "Engineer" shall mean the individual or individuals designated to represent the Owner or Architect in decisions affecting the work.

*****END OF SECTION*****

SECTION 01200 - CONTRACTORS GENERAL NOTES

1.01 THE GENERAL CONTRACTOR SHALL FAMILIARIZE HIMSELF WITH THE FOLLOWING:

A. The Contractor shall warranty and guarantee all materials and workmanship for a period of (1) year from the date of completion.

B. The Contractor shall secure Final Inspection and Certificate of Occupancy, prior to the Release of Final Payment by the Owner.

C. The Contractor shall provide and maintain Workman's Compensation and Builders Risk Insurance with the limits required by law and as specified herein.

D. All materials shall be new and of the quality specified. Substitutions will be allowed, but only with the Architects prior **written approval.** Verbal approvals to Contractors request for substitution are non-binding unless they are backed up with written documentation from the Architect.

E. The Contractor shall coordinate all work with the manufacturer's installation instructions and catalog cuts.

F. The Contractor and Subcontractors shall perform all work in accordance with the best trade practices typical to the projects geographical location.

G. Prior to final payment, the Contractor shall issue to the Owner, executed **"Final Release of Lien"** forms from all parties having lien rights against the Owner.

H. Unless where noted otherwise, the Contractor shall provide all the labor, material, equipment, and incidentals, including all testing as required in the Specifications by an independent testing laboratory, necessary for a complete and operating project.

I. The Contractor shall coordinate the work of all trades and/or Subcontractors and shall notify the Architect that all **long-lead items** for the project have been ordered as scheduled.

2.01 EXAMINATION OF SITE

A. Each Contractor shall carefully examine the site before submitting his bid. No allowance will be made him for a lack of full knowledge of all conditions at the site, except such underground conditions as are indeterminable before the commencement of the work.

3.01 SURVEY

A. The Contractor is responsible for staking out the building lines and certifying the slab elevation prior to the pouring of any concrete slabs. The Contractor is responsible for providing a final slab elevation survey and providing the Final Certificate to the Owner for his Flood Insurance qualification purposes.

4.01 OMISSIONS

A. The drawings and specifications are intended to cooperate. Anything shown on the drawings but not mentioned in the specifications, or vice versa, or anything not expressly set forth in either, but which is reasonably implied, shall be furnished as if specifically shown and mentioned in both, without extra charge.

B. Should anything be omitted from the drawings which is necessary for the proper construction of the work herein described, it shall be the duty of the Contractor to so notify the Owner in writing, if recognized, with a copy to the Architect. In the event of the Contractor failing to give notice, of a recognized error in the plans, he shall bear the extra cost in his/her work caused thereby without extra charge to the Owner as referenced in A.I.A. 201, General Conditions, included as part of the Contract documents.

5.01 DIMENSIONS

Figures given on the drawings govern scaled measurements and larger scale governs smaller. Do not scale the blackline prints.

6.01 INSPECTIONS

The Architect will review with the General Contractor, prior to the beginning of construction, all mandatory inspections. The General Contractor shall afford the inspector every facility for inspecting the work/materials. No piping, wiring, ducts, etc., shall be covered up until properly inspected and approved, and until certificates, if required, shall have been issued for same. The Contractor shall notify the Architect of each inspection being requested of the Building Department. The Contractor shall give the Architect a minimum of 24 hours advanced notice of a required or periodically requested inspection.

7.01 PROTECTION/SECURITY/STORAGE

The General Contractor shall provide and maintain the physical security of the property by providing normal lock up measures to preclude trespassing, burglary, and vandalism. All materials in or designated for the work shall be, at all times, suitably housed or protected with particular care being taken of all finished items. Building materials, Contractor's equipment, etc., may be stored on the premises but the placing of same shall be subject to the approval of the Owner. Whenever the Contractor makes a request for payment on

materials stored off-site, a Certificate of Insurance for that housed or stored material must be attached.

When any room in the building is utilized as a storage space, shop, etc., the parties making such use of those rooms shall be held responsible for any repairs, patching and cleaning that may arise from such use. The Owner, at any time during the construction of the project, may direct the Contractor to move materials stored in the building when it becomes necessary and this will be accomplished at no additional charge to the Owner.

8.01 CLEANING

The building must be kept free from all surplus material, dirt, and rubbish at all times, at the completion of the work all paint spots must be removed from the finished floors, walls, window and door frames and any glass where required. Finished glass scratched or etched due to cleaning shall be replaced by the Contractor. Limits of acceptance, of any scratched or etched glass, shall be made by the Owner.

9.01 GLASS BREAKAGE

The Contractor, before acceptance of the building, shall replace all glass that may have become broken, or damaged from any cause.

10.01 DOCUMENT EXISTING DAMAGE

The Contractor, prior to mobilizing on the site, shall document any existing damage to items such as interior ceilings, driveways, interior and exterior walls, floors, floor coverings, curbs, sidewalks, glass breakage, sprinkler heads, etc.
The Contractor will be responsible for repairing only those materials, directly and indirectly damaged, as a result of his work on the job site.

*****END OF SECTION*****

SECTION 01300 - SUBMITTALS

PART 1 - GENERAL

1.01 GENERAL

The provisions of this section apply to required submittals, related to units of work, not to administrative submittals such as payment requests, insurance certificates and progress reports. In addition to specific provisions of General and Supplementary Conditions related to submittals, individual specification sections of Divisions 2 through 16 contain submittal requirements, specific requirements in other sections have precedence over general requirements of this section.

PART 2 - PRODUCTS

2.01 PROCEDURAL REQUIREMENTS

A. General: Coordinate submittals with progress schedule and actual progress of work; allow ten (10) working days for Architect's and Engineer's processing of submittals requiring review and approval. Use transmittal form to establish complete record of submittals. Provide copies required by governing authorities, which are in addition to copies specified for submittal to the Architect.

B. Shop Drawings: Shall be submitted for manufactured or fabricated materials as called for in the separate specification section. Drawings shall be fully identifiable with project name, location, supplier's name, date, drawing number, specifications section reference, etc. **The Contractor shall submit, with such promptness as to cause no delay in his work or in that of any Subcontractor, four (4) copies of all shop drawings and schedules required for the work of the various trades to the Architect for review and comment.** The Contractor shall make no deviation from the approved shop drawings and/or the changes made thereto by the Architect if any. Additional prints, as may be required by the Contractor or a Subcontractor, shall be supplied by the Contractor.

C. It shall be the responsibility of the Contractor to properly schedule the submission of shop drawings for approval, to allow adequate time for the checking of drawings, manufacturer/fabrication of items, and the shipment of items to the job site in sufficient time so as to prevent any delay in the Progress Schedule.

D. It shall be the responsibility of the Contractor to coordinate the preparation of shop drawings of those items which will be furnished by more than one manufacturer, but are designed to interface with the overall project when installed.

E. When a LEED Project- LEED Submittals: Comply with requirements specified in Division 1 Section 01330, Sustainable Design Reporting. Provide data in a PDF electronic format.

F. Shop Drawings submitted to the Architect for approval shall first show evidence of being checked by the Contractor, the prima-facie evidence of which shall be a "CHECKED" stamp marked "APPROVED" or "APPROVED AS NOTED" on each copy of each shop drawings, placed thereon by the Contractor. **Shop drawings received without the Contractor's "CHECKED" stamp will be cause for immediate return without further action by the Architect until properly resubmitted.** Each drawing correctly submitted will be checked by the Architect and marked by him in one of the following ways:

a.	REVIEWED:	**NO EXCEPTIONS TAKEN**
b.	REVIEWED:	**NOTE COMMENTS AND MAKE CORRECTIONS AS NOTED**
c.	REVIEWED:	**REVISE AND RESUBMIT**
d.	REVIEWED:	**REJECTED**

G. Copies of Product Data: mark each copy to indicate actual product to be provided; show selections from among options in manufacturer's printed product data. Submit four copies; three copies of which will be returned. The Contractor shall maintain a copy at the project site for reference purposes. Do not proceed with installation of manufactured products until a copy of related product data is in the installer's possession.

2.02 SUBSTITUTIONS

A. Approval Required:

1. The Contract is based on the standards of quality established in the Contract Documents.
2. All products proposed for use, including those specified by required attributes and performance, shall require review by the Architect before being incorporated into the work.
3. Do not substitute materials, equipment or methods unless such substitution has been specifically reviewed and approved for this work by the Architect, in writing.

B. "Or Equal":

1. Where the phrase "or equal" or "or equal as approved by the Architect" occurs in the Contract Documents, do not assume that materials, equipment or methods will be approved as equal unless the item has been specifically approved in writing by the Architect.
2. The decision of the Architect shall be final.

*****END OF SECTION*****

SECTION 01400 - QUALITY CONTROL

PART 1 - GENERAL

1.01 GENERAL:

The work of this section includes Quality Assurance; and the independent laboratory and field sampling, testing, inspections, supervision and reports of those materials required by the various sections of these specifications. Tests and inspections shall be performed by a recognized Testing Laboratory selected by the Contractor and approved by the Architect.

1.02 COOPERATION:

A. Testing Laboratory shall cooperate with all trades whose work affects or is affected by the tests and inspections.

B. Contractor shall cooperate with and provide assistance necessary in taking samples, making field tests and making inspections, and he shall schedule and coordinate his work to hold costs of tests and inspections to a reasonable minimum.

1.03 PAYMENTS:

A. Costs for tests and inspections shall be incurred by the Contractor.

B. If the results of any test or inspection indicate failure to meet the specified requirements, the Contractor shall be responsible for the costs of retesting or reinspection.

C. Manner of Work: When in the opinion of the Architect, tests or inspections are required because of the manner in which the Contractor does his work, such as questionable quality of materials and/or workmanship, questionable sources of material, substitution of materials or sources of same for those previously accepted, or failure or material to comply with specification or plan requirements; the costs for such tests or inspections shall be incurred by the Contractor.

D. Should the Contractor refuse to perform such tests, the direct cost of testing, incurred by the Owner, shall be deducted from the Contract sum for construction.

1.04 DEFECTIVE MATERIALS:

The Architect reserves the right to demand for test or special examination any material or part thereof to insure compliance with the specification and he may reject any material or part judged defective as a result of such tests and the Contractor shall replace such defective material or part with material or part that does comply with the specifications at

no additional expense to the Owner.

1.05 REPORTS:

Test and inspection reports shall be written immediately upon conclusion of each procedure; copies shall be provided to the following:

Architect
Contractor

1.06 TEST CRITERIA:

The specific test and inspection procedures and their required results are enumerated herein by reference to recognized standards and shall be the required method for testing and judging the results unless deviations from the standards are specifically mentioned.

1.07 STANDARDS:

Applicable Standards listed in these Specifications include, but are not necessarily limited to, standards promulgated by the following agencies and organizations.

1. ASHTO = American Association of State Highway and Transportation Officials, 341 National Press Building, Washington, D.C. 20004.

2. ACI = American Concrete Institute, Box 19150, Redford, Station, Detroit, Michigan 48219.

3. AISC = American Institute of Steel Construction, Inc. 1221 Avenue of the Americas, New York, NY 10020.

4. ANSI = American National Standards Institute (successor USASI and ASA) 1430 Broadway, New York, NY 10018

5. ASTM = American Society for Testing and Materials, 1916 Race Street, Philadelphia, PA 19103

6. AWS = American Welding Society, Inc., 2501 N.W. 7th Street, Miami, FL 33125

7. AWWA = American Water Works Association, Inc., 6666 West Quincy Ave., Denver, CO 80235

8. CRSI = Concrete Reinforcing Steel Institute, 228 North Lasalle Street, Chicago, IL 60610

9. CS = Commercial Standard of NBS, U.S. Department of Commerce, Government

Printing Office, Washington, DC 20402

10. FGMA = Flat Glass Marketing Association, 3310 Harrison, Topeka, KS 66611

11. NAAMM = The National Association of Architectural Metal Manufacturers, 1033 South Boulevard, Oak Park, IL 60302

12. NEC = National Electrical Code (see NFPA)

13. NEMA = National Electrical Manufacturers Association, 155 East 44th Street, New York, NY 10017

14. NFPA 1, 101 and 5,000 = National Fire Protection Association (Life Safety Code) 470 Atlantic Avenue, Boston, MA 02210

15. SBCC = Southern Building Code Congress International, Inc. 900 Montclair Road, Birmingham, AL 35213

16. FBC = Florida Building Code, latest adopted addition.

*****END OF SECTION*****

SECTION 01500 – TEMPORARY FACILITIES & CONTROLS

PART 1 – GENERAL

1.01 GENERAL

Refer to General Conditions for commitments which result in requirements for Contractor to provide temporary facilities as may be required for performance of the work and fulfillment of the Contract. This section specifies certain minimum temporary facilities to be provided regardless of methods and means selected for performance of the work, but not by way of limitation and not assured for compliance with governing regulation. Use of alternate temporary facilities is Contractor's option, subject to Owner's acceptance. Temporary facilities is defined to exclude tools and construction machines, testing, demolition, alterations, soil borings, mock-ups and similar items. The Contractor shall be responsible for the cost of all consumed utilities, unless noted otherwise herein until such time as the Owner is issued the "Certificate of Occupancy".

PART 2 – PRODUCTS

2.01 DEWATERING

Maintain site and construction work free of water accumulation. Do not endanger the work or adjacent properties. Maintain protection against flooding. Protect existing drainage systems.

2.02 POWER DISTRIBUTION

Provide weatherproof, grounded circuits with groundfault interruption feature, with proper power characteristics and either permanently wired or plug-in connections as appropriate for intended use. Provide overload-protected disconnect switch for each circuit at distribution panel. Space 4-gang convenience outlets (20 Amp circuit) so that every portion of work can be reached with a maximum 100-foot extension cord.

2.03 TEMPORARY LIGHTING

Provide lighting of intensity and quality sufficient for proper and safe performance of the work, and for access thereto.

2.04 TEMPORARY DRIVES

Where feasible, use sub-base and base construction of permanent drives and paving as temporary paved construction areas; and delay installation of finish paving courses until possibility of damage from construction operations has been minimized. Otherwise, provide not less than compacted subgrade of satisfactory soil material. Remove temporary paving when no longer needed.

2.05 TEMPORARY UTILITIES

Unless noted otherwise herein, provide necessary connections, piping, valves, meters and hoses from the distribution points on the site where water and electric power are necessary to carry on the work. Upon completion of the work, remove all temporary utilities. Contractor shall incur the cost of the temporary utility charges through substantial completion.

2.06 HOISTING, GENERAL

Provide cranes, hoists, and similar temporary construction facilities as needed to adequately perform the work. Comply with manufacturer's instructions and governing regulations for installation, operation and removal.

2.07 MISCELLANEOUS FACILITIES

Provide miscellaneous facilities as needed, including temporary stairs, ramps, ladders, runway staging, shoring, scaffolding, railings, dust controls, bracings, barrier closures, platforms, temporary partitions, waste chutes, storage shed, and similar items.

2.08 TEMPORARY TOILETS

Where permitted by governing regulations, provide single-occupant, self-contained units of either chemical aerated recirculation type or combustion type; glass fiber reinforced polyester enclosure; equipped with both urinal and stool fixtures. Supply units with tissue and, where not located nearby, separate wash facilities, supply with wet-type hand towels and waste containers. Locate units so that personnel will travel no more than 200', including distance horizontally, to reach a unit.

2.09 LOCKUP AND SECURITY

As construction of building structure or shell progress and it becomes feasible to secure project against intrusion, provide temporary security enclosure, doors and locks as necessary to prevent unauthorized entrance. Deliver, store and lockup materials and equipment in a manner which will prevent theft and vandalism.

2.10 ENVIRONMENTAL PROTECTION

Review exposure to possible environmental problems with Architect and Civil Engineer. Establish procedures and discipline among tradesmen and provide needed facilities which will protect against environmental problems (i.e: pollution of air, water and soil, silt fencing, gravel aprons at construction drive, excessive noise, and similar problems).

2.11 TEMPORARY WATER

The Contractor and his Subcontractors shall utilize a temporary water service as required for construction. The Contractor, unless noted otherwise herein, shall request, apply for, and pay the connection fee. The Contractor shall incur the meter cost and all monthly water usage costs, payable to the Utility Company having jurisdiction over the site. The Contractor shall utilize the water for construction and to sustain any specified landscaping until the final irrigation system is operating.

2.12 JOB SITE PHONE AND FIELD OFFICE

The Contractor will be required to maintain a jobsite telephone, and computer. In lieu of a jobsite telephone, a cell phone with voice mail capability for the job superintendent is acceptable. The Contractor shall provide the phone number to the Owner's field representative and the Architect. Unless stipulated otherwise, a job site Field Office is required for this project.

2.13 TEMPORARY CHAIN LINK FENCING AND GATES

Unless noted otherwise herein, the Contractor will be required to erect temporary galvanized chain link fencing, posts and gates to secure the construction and mobilization areas. The Contractor will be responsible for reviewing the proposed location of the fencing with the Architect or Owner's field representative prior to erecting the fence. Minimum fence and gate height shall be 6 feet. Tops of galvanized fencing shall have turned down safety edges. Gates shall be locked at the end of the day's construction. All locks shall be supplied by the Contractor.

2.14 CONSTRUCTION SIGNAGE

The Contractor will be required to provide and erect the job site sign in accordance with Specification Section 10440 article 2.01, unless instructed otherwise by the Owner. Note: Consult with the Owner for any special displays of Grant Funding Agencies that may require their name, logo, etc. to be included on the construction sign.

PART 3 – EXECUTION

3.01 GENERAL

A. Comply with applicable requirements specified in Division 15 – Mechanical, and Division 16 – Electrical.

B. Maintain and operate systems to assure continuous service and modify and extend systems as work progress requires.

3.02 REMOVAL

A. Completely remove temporary materials and equipment when their use is no longer required and leave the site in a clean condition. Clean and repair damage caused by temporary installations or use of temporary facilities.

*****END OF SECTION*****

31 March 2016

SECTION 01700 - PROJECT CLOSEOUT

PART 1 - GENERAL

1.01 GENERAL

The provisions of this section apply primarily to closeout of actual physical work, not to administrative matters such as final payment and changeover of insurance. Specific requirements in other sections have precedence over general requirements of this section.

1.02 RECORD DOCUMENTATION

A. Record Drawings: Contractor shall maintain a complete set of blueprints of contract drawings and shop drawings for record mark-up purposes throughout the Contract Time. Mark-up drawings during the course of the work to show changes and actual installation conditions, sufficient to form a complete record for Owner's purposes. Give particular attention to work for Owner's purposes. Give particular attention to work which will be concealed and difficult to measure and record at a later date, particularly work which may require servicing or replacement during the life of the project. Request subcontractors and mechanics marking the prints to sign and date each mark-up. Bind prints into manageable sets, with durable paper covers, appropriately labeled. Record drawings to be available at time of landscaping.

B. Operation and Maintenance Manuals: **Provide (2) two 3-ring vinyl-covered binders** containing required maintenance manuals, properly identified and indexed. Include operating and maintenance instructions; extended to cover emergencies, spare parts, warranties, inspection, procedures, diagrams, safety, security, and similar appropriate data for each system or equipment item. Provide names and phone numbers of all subcontractors and suppliers as a cover sheet in the binder.

1.03 OPERATOR INSTRUCTIONS

A. Require each installer of systems requiring continued operation/maintenance by Owner's operating personnel, to provide on location instruction to Owner's personnel, sufficient to ensure safe, secure, efficient, non-failing utilization and operation of systems. Provide instructions for the following categories of work:

1. Mechanical, electrical and electronic systems (not limited to work of Divisions 15 and 16). Live plant materials, lawns and irrigation systems well, pump, potable water treatment systems, fire sprinklers, security system, and fire alarm control system.

PART 3 - EXECUTION

3.02 FINAL CLEANING

At closeout time, clean or reclean entire work to normal level for "first class" maintenance/cleaning of building projects of a similar nature. Remove non-permanent protection and labels, polish glass, clean exposed finishes, touch-up minor finish damage, clean or replace filters of mechanical systems, remove debris and broom-clean non-occupied spaces, sanitize plumbing facilities, clean light fixtures and replace burned-out/dimmed lamps, sweep and wash paved areas, police yards and grounds to the property line, and perform similar cleanup operations needed to produce a "clean" condition as determined by Architect and Owner's Representative.

3.02 PROCEDURES AT SUBSTANTIAL COMPLETION

A. Prerequisites: Comply with General Conditions and complete the following before requesting the Architect's inspection of the work, or designated portion thereof, for substantial completion:

1. Complete installation of building and equipment to such level as the Owner could, if necessary, occupy the facilities.

2. Submit executed warranties, workmanship bonds when required, maintenance agreements, inspection certificates and similar required documentation for specific units of work, enabling Owner's unrestricted occupancy and use.

3. Complete instruction of Owners operating personnel and start-up of systems.

4. Complete final cleaning, and remove temporary facilities and tools.

B. Inspection Procedures: Upon completion of Contractor's request for inspection the Architect will either proceed with inspection or advise Contractor of prerequisites not fulfilled. Following initial inspection, the Architect will either prepare the Certificate of Substantial Completion, or advise Contractor of work which must be performed prior to issuance of certificate; and repeat inspection when requested and assure that work has been substantially completed. Results of completed inspection will form initial "punch-list" for final acceptance.

3.03 PROCEDURES AT FINAL ACCEPTANCE

A. Upon receipt of Contractor's notice that work has been completed, including punch-list items resulting from earlier inspections, and accepting incomplete items delayed because of acceptable circumstances, the Architect will reinspect the work. Upon completion of reinspection the Architect will either recommend final

acceptance and final payment, or advise contractor of work not completed or obligations not fulfilled as required for final acceptance, and if necessary, the procedure will be repeated.

*****END OF SECTION*****

07 May 2014

SECTION 01800 - GENERAL CONDITIONS

1.01 INCLUSION OF AIA DOCUMENT A-201:

A. The General Conditions of the Contract for Construction, The American Institute of Architects Document **A-201; 2007** Edition, with modifications shall apply to, and form part of this section for all project delivery systems. A copy is included in this section for review.

1.02 OWNER CONTRACTOR AGREEMENT:

A. Where the project delivery system is **DESIGN, BID, BUILD,** the Owner-Contractor Agreement shall be The American Institute of Architects Document **A-101; 2007 Standard Form of Agreement Between Owner and Contractor** where the basis of payment is a **Stipulated Sum**. A copy is available from the Architect upon request.

2.01 RELEASE OF LIENS:

All applications for Payment, with the exception of the initial pay request, are to be accompanied by executed Partial Release for Liens from those Subcontractors having performed work under the previous Application for Payment. Neither the final payment nor any part of the retained percentage which has come due, shall be paid until the Contractor has delivered to the Owner a complete **"Final Release of Liens"** arising out of this contract and, if so required by the Owner, an affidavit stating that so far as he has knowledge or information, the release is inclusive of all labor and material for which a lien could be filed. The Contractor may, at the option of the Owner, furnish a bond deemed satisfactory to the Owner to indemnify himself against any liens.

3.01 SUBCONTRACTORS:

A list of the proposed primary subcontractors utilizing (AIA Document **G705** or similar format) must be submitted to the Owner at the bid opening when projects are Competitively Bid. A copy of form G705 is included in Section 01010 of this project manual. All subcontractors agree to be bound by the terms of the General Conditions, the drawings, and the specifications in so far as they are applicable to his/her portion of the work.

4.01 GUARANTEE:

The Contractor shall be responsible for, and shall make good, any defects in the work due to faults in labor or materials, which arise or come to be discovered within one (1) year after the completion of the work, as determined by the substantial completion inspection by the Architect and the Owner. The General Contractor shall obtain from the various Subcontractors, all written guarantees herein specified and shall deliver same to the Owner before the building shall be deemed finished and accepted.

5.01 CUTTING AND PATCHING:

All cutting and patching required to execute and complete any and all work under this contract shall be done by the General Contractor or his Subcontractors. The decision as to which Sub/Contractor shall do the cutting and patching shall be in accordance with local customs, but in the case of a dispute as to which Contractor shall do the cutting and patching, the final decision shall be made by the General Contractor. All penetrations through fire rated construction shall be fire stopped as per the current edition of the Florida Building Code and the Underwriters Laboratory, Fire Resistant Directory.

6.01 CHANGES:

It is understood that the Owner shall have the right, during the progress of construction, to make any alterations, additions, or omissions that he may desire as to the work of materials herein specified or shown on the plans. The same right shall be carried into effect by the General Contractor without in any way violating or vitiating the contract, but if such changes are made, the value of same must be agreed upon, in writing, between the Owner, the Architect and the General Contractor or the Owners Request for changes are non-binding. All Change Orders must be approved by the Owner's Governing Board before work is started. No omissions will be allowed nor extra work paid for, unless it has been so ordered in writing.

7.01 RESPONSIBILITIES FOR ACCIDENTS:

The General Contractor shall bear losses or damages from accidents which may occur to any person or persons, by or on account of the execution of the work, until such time as possession is taken by Tenant. The Contractor must provide all legal and necessary guards, barricades, lights, etc., during the course of the work. The General Contractor is solely responsible for job-site safety.

8.01 JOBSITE SUPERINTENDENT:

The Contractor shall have a full-time, on-site, job superintendent assigned to the project. The job superintendent is to be assigned, in writing, by the Contractor with the individual's name submitted to the Owner, through the Architect, for approval. An alternate on-site job superintendent shall also be named n the event the primary superintendent cannot meet his daily obligations (sickness, vacation, etc.). The same initial jobsite superintendent is to be available onsite during all project working hours throughout the extent of construction and until delivery of the project the Owner. **NOTE:** In the event the Contractor replaces the job-site superintendent prior to substantial completion, and the Architect must spend extra time to educate and inform a new superintendent of jobsite conditions, the General Contractor will compensate the Architect for his additional time at $165.00 per hour, including travel time and mileage at $.50 per mile.

9.01 BUILDING PERMITS AND CODE:

The Contractor shall endeavor to comply with all mandatory codes pertaining to his work. Costs of all compliance requirements are to be included in the Contractor's contract price.

10.01 SAFETY:

No parts of this facility will be occupied during construction or renovation unless all existing exits and any existing fire protection measures are continuously maintained, or in lieu thereof, other measures are taken to provide equivalent safety. The General Contractor is solely responsible for the safety and the security of the jobsite during normal working hours or when workers are present after normal work hours. The General Contractor shall coordinate access and security with any existing building or site security contractors or agencies under the direct auspices of the Owner, for the duration of the work.

11.01 PROGRESS SCHEDULE AND REPORTS:

Within twenty (20) days of the date established for commencement of the work, the Contractor shall submit to the Architect the following items:

1. A comprehensive, bar-graph, Microsoft Project pdf, or similar format, **Progress Schedule** indicating a time bar for each significant category of work, arranging the schedule to indicate the required sequencing of each work task. This progress schedule shall be updated monthly throughout the construction phase.

2. Project billing **Schedule of Values, A.I.A. document G-703,** or a similar software format approved by the Architect, for review and approval.

NOTE: The submitted progress schedule should match the tasks on the schedule of values as close as possible to assist the Owner and Architect in tracking the project progress.

*****END OF SECTION*****

SECTION 01820 - SUPPLEMENTARY GENERAL CONDITIONS, INSURANCE LIMITS

1.01 BUILDING PERMITS AND CODE:

The successful Bidder shall comply with all mandatory codes pertaining to his work. Cost of all compliance requirements are to be part of the Contractors Base Bid.

2.01 PAYMENT:

The Contractor may requisition payment for work completed at intervals of not less than four (4) weeks. Requests must be based on work completed, including materials stored on the site and as yet not incorporated into the construction, and must be itemized by major components. At the option of the Owner, payment for materials stored offsite may be authorized on the provision that the Contractor provides written proof of insurance for the specific material in question. (Proof of insurance must specifically identify the material and the project by name). Ten percent (10%) will be withheld from all equal amounts prior to completion. Final payment will be made following completion and acceptance of the work by the Owner and Architect. **A.I.A. Documents G-702 and G-703; 1992 Edition,** Application and Certificate for Payment, shall be the format for applications for payment. The Contractor is to submit payment applications along with executed Partial Release of Liens from those Subcontractors as applicable, in triplicate, to the Architect, allowing time for the Architect's inspection and review, three (3) days, as well as for Owner's review and processing time of ten (10) days.

3.01 INSURANCE:

Contractor shall not commence work under this contract until he has obtained all insurance required under this Section and such insurance has been approved by the Owner, nor shall the Contractor allow any Subcontractor to commence work on his subcontract until all similar insurance required of the Subcontractor has been so obtained and approved by the Owner.

A. Worker's Compensation: Must meet statutory requirements for Florida workers' compensation.

B. Commercial General Liability: coverage shall provide minimum limits of liability of $1,000,000 per occurrence Combined Single Limit for Bodily Injury and Property Damage. This shall include coverage for:
   1. Premises/Operations
   2. Products/Completed Operations
   3. Contractual Liability
   4. Independent Contractors.

C. Business Automobile Liability: coverage shall provide minimum limits of liability of $1,000,000 per occurrence Combined Single Limit for Bodily Injury and Property Damage. This shall include coverage for:
   1. Owned autos
   2. Hired Autos
   3. Non-Owned Autos.

D. Builders Risk Insurance: Coverage shall be all-risk with limits equal to 100 percent of the completed value of the building. It shall include a machinery/equipment endorsement to provide coverage with a maximum deductible allowable at $500 per claim.

E. Performance Bond: $1,000,000 performance bond is required.

4.01 CERTIFICATE OF INSURANCE:

A. Ten (10) days prior to commencement of work under this contract a certificate of insurance will be provided to the Owner for review and approval. The certificate shall provide the following:

   1. The Owner shall be named as an additional insured on both the general liability and business automobile policies.

   2. The Architect shall be named as an additional insured on the Contractor's general liability policy.

   3. The Civil Engineer shall be named as an additional insured on the Contractor's general liability policy.

   4. The Owner will be given thirty (30) days' notice prior to the cancellation or modification of any stipulated insurance. Such notice shall be in writing by registered mail, return receipt requested, and addressed to the Owner.

NOTE: It shall be the responsibility of the Contractor to insure that all subcontractors comply with all insurance requirements.

*****END OF SECTION*****

SECTION 02200 – EARTHWORK

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

A. Drawing and general provisions of Contract, including General and Supplementary Conditions and Division 1 General Requirements, apply to this Section.

1.02 SUMMARY

A. This Section includes the following:

1. Preparing of subgrade for building slabs, walks, pavements and landscaped areas.
2. Excavating and backfilling for underground sewers, mechanical and electrical appurtenances.

B. Excavating and Backfilling for Mechanical/Electrical Work: Refer to Divisions 15 and 16 sections for excavating and backfill required in conjunction with underground mechanical and electrical utilities and buried mechanical and electrical appurtenances.

C. Final Grading, together with placement and preparation of topsoil for lawns and planting, is specified in Division 2 Section, "Grassing by Sodding".

1.03 DEFINITIONS

A. Excavation consists of removal of material encountered to subgrade elevations indicated and subsequent disposal of materials removed.

B. Unauthorized excavation consists of removal of materials beyond indicated subgrade elevations or dimensions without specific direction of the Project Architect/Engineer. Unauthorized excavation, as well as remedial work directed by the Project Architect/Engineer, shall be at the Contractor's expense.

1. Under footings, foundation bases, or retaining walls, fill unauthorized excavation by extending indicated bottom of footing or base to excavation bottom, without altering required top elevation. Lean concrete fill may be used to bring elevations to proper position, when acceptable to the Project Architect/Engineer.
2. In locations other than those above, backfill and compact unauthorized excavations as specified for authorized excavations as same classification, unless otherwise directed by the Project Architect/Engineer.

C. Additional Excavation: When excavation has reached required subgrade elevations,

notify the Project Architect/Engineer, who will make an inspection of conditions. If the Project Architect/Engineer determines that bearing materials at required subgrade elevations are unsuitable, continue excavation until suitable bearing materials are encountered and replace excavated material as directed by the Project Architect/Engineer. The Contract Sum may be adjusted by an appropriate Contract Modification.

1. Removal of unsuitable material and its replacement as directed will be paid on basis of Conditions of the Contract relative to changes in the work.

D. Subgrade: The undisturbed earth or the compacted soil layer immediately below granular sub-base, drainage fill, or topsoil materials.

E. Structure: Buildings, foundations, slabs, tanks, curbs, or other man-made stationary features occurring above or below ground surface.

1.04 SUBMITTALS

A. Test Reports: Submit the following reports directly to the Project Architect/ Engineer from the testing services, with copy to Contractor:

1. Test reports on borrow material.
2. Verification of suitability of each footing subgrade material, in accordance with specified requirements.
3. Field reports: in-place soil density tests.
4. One optimum moisture-maximum density curve for each type of soil encountered.
5. Report of actual unconfined compressive strength and/or results of bearing tests of each strata tested.

1.05 QUALITY ASSURANCE

A. Codes and Standards: Perform excavation work in compliance with applicable requirements of authorities having jurisdiction.

B. Trenching to comply with OSHA Standard 29CFR, Section 1926-650 subpart P. Contractor to provide written assurance of compliance.

C. Testing and Inspection Service: The Contractor will employ and pay for a qualified independent geotechnical testing and inspection laboratory to perform soil testing and inspection service during earthwork operations.

D. Degree of Compaction: Required compaction is expressed as a percentage of maximum density by test procedures of ASTM D1557.

1.06 PROJECT CONDITIONS

A. Bidders shall inform themselves of location and nature of work, character of equipment and facilities needed for performance of work, general and local conditions prevailing at site, and other matters which may in any way affect work under this contract in accordance with DIVISION 1, GENERAL REQUIREMENTS.

B. Site Information: Data in subsurface investigation reports was used for the basis of the design and are available to the Contractor for review and compliance with recommendations. Conditions are not intended as representations or warranties of accuracy of continuity between soil borings. The Owner will not be responsible for interpretations or conclusions drawn from this data by the Contractor.

1. Additional test borings and other exploratory operations may be performed by Contractor, at the Contractor's option; however, no change in the Contract Sum will be authorized for such additional exploration.
2. The Soils Report shall be a part of these specifications and shall have the same force and effect as the specifications.

C. Existing Utilities: Locate existing underground utilities in areas of excavation work. If utilities are indicated to remain in place, provide adequate means of support and protection during earthwork operations.

1. Should uncharted, or incorrectly charted, piping or other utilities be encountered during excavation, consult Project Architect/Engineer and utility owner immediately for directions. Cooperate with Owner and utility companies in keeping respective services and facilities in operation. Repair damaged utilities immediately to satisfaction of utility owners.
2. Do not interrupt existing utilities serving facilities occupied by Owner or others, during occupied hours, except when permitted in writing by the Project Architect/Engineer and then only after acceptable temporary utility services have been provided.
   a. Provide a minimum of 48-hour notice to the Project Architect/Engineer, and receive written notice to proceed before interrupting any utility.
3. Demolish and completely remove from site existing underground utilities indicated to be removed. Coordinate with utility companies for shutoff of services if lines are active.

D. Use of Explosives: Use of explosives is not permitted.

E. Protection of Persons and Property: Barricade open excavations occurring as part of this work and post with warning lights.

1. Operate warning lights as recommended by authorities having jurisdiction.
2. Protect structures, utilities, sidewalks, pavements, and other facilities from damage caused by settlement, lateral movement, undermining, washout, and

other hazards created by earthwork operations.

3. Perform excavation by hand within drip-line of large trees selected to remain. Protect root systems from damage or dry out to the greatest extent possible. Maintain moist condition for root system and cover exposed roots with moistened burlap.

F. Maintain existing bench marks, monuments and other reference points, if disturbed or destroyed, replace as directed by the project Architect/Engineer.

G. Condition of Premises: Accept site as found and excavate, fill and backfill site as indicated on the drawings and as specified in this Section.

PART 2 - PRODUCTS

2.01 SOIL MATERIALS

A. "Satisfactory Fill Materials" include materials classified in ASTM D2487 as GW, GP, SW and SP properly worked by Contractor to obtain optimum moisture and compaction. Within 2 feet of the surface of the indicated grade, limit rock size to 3 inches. Below 2 feet of the surface of indicated grade, limit rock size to 12 inches.

B. "Unsatisfactory Materials" include materials other than "Satisfactory Fill Materials"; however, materials of any classification that are determined by testing laboratory as too wet or too soft for providing a stable foundation for structure, paving and walks will be classified as "unsatisfactory".

C. Subbase Material: Naturally or artificially graded mixture of natural or crushed gravel, crushed stone, crushed slag, and natural or crushed sand.

D. Drainage Fill: Washed, evenly graded mixture of crushed stone, or crushed or uncrushed gravel, with 100 percent passing a 1-1/2 inch sieve and not more than 5 percent passing a No. 4 sieve.

E. Backfill and Fill Materials: Satisfactory soil materials free of clay, rock or gravel larger than 2 inches in any dimension, debris, waste, muck, vegetation and other deleterious matter.

PART 3 - EXECUTION

3.01 INSPECTION

A. Do not proceed with the work of this section until conditions detrimental to the proper and timely completion of the work have been corrected in an acceptable manner.

3.02 GENERAL

A. Public Safety: Accomplish work in a manner that provides for safety of the public and workers and provides for the protection of property.

B. Construction: Do not close, obstruct or store material or equipment in streets, sidewalks, alleys or passageways without a permit in accordance with local ordinances, regulations, codes and Owner approval.

C. Interference: Conduct operations with minimum interference with roads and other facilities.

D. Debris Removal: Do not store or permit debris to accumulate on site.
   1. If Contractor fails to remove excess debris promptly, Owner reserves the right to cause same to be removed at Contractor's expense.

E. Erosion Repair: Take every precaution and temporary measure to prevent damage from erosion of freshly graded areas.
   1. Repair and re-establish grades to required elevations and slopes where settlement/washing occurs prior to acceptance of work.

F. Temporary Structures: Remove temporary structures when no longer required.

3.03 LOCATIONS AND ELEVATIONS

A. Be responsible for surveys, measurements and layouts required for proper execution of work.
   1. Lay out lines and grades from existing survey control system and as shown on Site Plan.

B. Locate by stake and mark, locations and elevations of the following:
   1. Elevations of existing earth cut and fill.
   2. Final grades for landscape contours.
   3. Other items as required to execute work under this Section of the specifications.

3.04 CLEARING AND GRUBBING

A. Shall be in accordance with SECTION 02110 - SITE CLEARING AND GRUBBING.

3.05 STRIPPING

A. Strip turf, organic material, muck surface litter, rubble and overburden for entire depth of root system of grass or other vegetation and/or to bottom of muck layer within all areas of construction as indicated on Site Plan(s).

B. Stockpile clean topsoil on site to be used in the final grading work as an underlayment for sod and landscaping proposed for the site.

3.06 EXCAVATION

A. Shall be in accordance with this subsection and SECTION 02202 - EXCAVATION.

B. Begin excavation after stripping, clearing and compaction where applicable, has been completed.

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

D. Excavations for appurtenances and structures shall conform to dimensions and elevations and shall extend a sufficient distance from walls and footings to allow for placing and removal of forms and installation of services, except where the concrete for walls and footings is authorized to be deposited directly against excavation surfaces. All excavation below general machine excavation for footings and foundations shall be hand worked. Bottoms of all (footings and appurtenances) shall be on level planes.

E. Remove "unsatisfactory materials" encountered from the building areas.

F. Excavate in such a manner that quick and efficient drainage of storm water will be affected.

G. Classify excavated materials and stockpile separately suitable soils for use as backfill materials. If sufficient quantities of excavated materials meeting requirements for backfill are not available on site, provide materials meeting these requirements.

H. Stockpile excavated material suitable for use as fill and backfill.

3.07 STABILITY OF EXCAVATIONS

A. General: Comply with local codes, ordinances, and requirements of agencies having jurisdiction. Comply with OSHA Standard 29CFR, Section 1926-650 subpart P.

B. Slope sides of excavations to comply with local codes, ordinances, and requirements of agencies having jurisdiction. Shore and brace where sloping is not possible because of space restrictions or stability of material excavated. Maintain sides and slopes of excavations in safe condition until completion of backfilling.

C. Shoring and Bracing: Provide materials for shoring and bracing, such as sheet piling, uprights, stringers, and cross braces, in good serviceable condition for all trenches in excess of 5 feet deep. Maintain shoring and bracing in excavations regardless of time period that excavations will be open. Extend shoring and bracing as excavation progresses. Contractor shall design and install a trench safety system in accordance with SECTION 02201 - TRENCH SAFETY SYSTEM.

3.08 DEWATERING

A. Prevent surface water and subsurface or ground water from flowing into excavations and from flooding project site and surrounding area.

1. Do not allow water to accumulate in excavations. Remove water to prevent softening of foundation bottoms, undercutting footings, and soil changes detrimental to stability of subgrades and foundations. Provide and maintain pumps, well points, sumps, suction and discharge lines, and other dewatering system components necessary to convey water away from excavations.
2. Establish and maintain temporary drainage ditches and other diversions outside excavation limits to convey rain water and water removed from excavations to collecting or runoff areas. Do not use trench excavations as temporary drainage ditches.

B. Dewater excavations for inspection and for construction so that no concrete or fill is placed in water and so that concrete less than 8 hours of age is not subjected to ground water pressure.

C. Keep excavations free of water while backfilling and construction therein takes place.

D. Dispose of water, resulting from dewatering operations in accordance with city, county, state and federal regulations.

E. Conduct operations so that storm water runoff sediment is not discharged to the adjacent lakes, waterways, sewers, streets and adjacent properties.

3.09 STORAGE OF EXCAVATED MATERIALS

A. Stockpile excavated materials acceptable for backfill and fill where directed. Place, grade, and shape stockpiles for proper drainage.

1. Locate and retain soil materials away from edge of excavations. Do not store within drip line of trees indicated to remain.
2. Dispose of excess excavated soil material and materials not acceptable for use as backfill or fill. Material shall become property of Contractor and shall be promptly removed from the site.

3.10 EXCAVATION FOR STRUCTURES

A. Conform to elevations and dimensions shown within a tolerance of plus or minus 0.10 foot, and extending a sufficient distance from the footings and foundations to permit placing and removal of concrete form work, installation of services, and other construction for inspection.

1. Excavations for footings and foundations: Do not disturb bottom of excavation. Excavate by hand to final grade just before concrete reinforcement is placed. Trim bottoms to required lines and grades to leave solid base to receive other work.
2. Excavation for Underground Tanks, Basins, and Mechanical or Electrical Structures: Conform to elevations and dimensions indicated within a tolerance of plus or minus 0.10 foot; plus a sufficient distance to permit placing and removal of concrete form work, installation of services, and other construction for inspection. Do not disturb bottom of excavations intended for bearing surfaces.

3.11 EXCAVATION FOR PAVEMENTS

A. Cut surface under pavements to comply with cross-sections, elevations and grades as indicated.

3.12 TRENCH EXCAVATION FOR PIPES AND CONDUIT

A. Excavate trenches per requirements of SECTION 02201, Division 15 and 16 to uniform width, sufficiently wide to provide ample working room and a minimum of 9 to 12 inches of clearance on both sides of pipe or conduit.

B. Excavate trenches and conduit to depth indicated or required to establish indicated slope and invert elevations and to support bottom of pipe or conduit on undisturbed soil.

1. Where rock is encountered, carry excavation 6 inches below required elevation and backfill with a 6-inch layer of tamped sand or gravel prior to installation of pipe.
2. For pipes or conduit less than 6 inches in nominal size, and for flat-bottomed, multiple-duct conduit units, do not excavate beyond indicated depths. Hand-excavate bottom cut to accurate elevations and support pipe or conduit on undisturbed soil.
3. For pipes and equipment 6 inches or larger in nominal size, shape bottom of trench to fit bottom of pipe for 90 degrees (bottom 1/4 of the circumference). Fill depressions with tamped sand backfill. At each pipe joint, dig bell holes to relieve pipe bell of loads and to ensure continuous bearing of pipe barrel on bearing surface.

3.13 FILLING, BACKFILLING AND COMPACTION

A. The work consists of compaction of existing earth surfaces, excluding rock, after excavation, filling and compaction of said area to levels required with suitable backfill material.

B. Materials: "Satisfactory Fill Materials" shall be used in fills and backfills.

C. Filling and Backfilling: Place "Satisfactory Fill Material" in horizontal layers not exceeding 12 inches in loose depth. Compact as specified herein. No material shall be placed on surfaces that are muddy.

D. Compaction: Compaction shall be with equipment suited to soil being compacted. Moisten or aerate material, as necessary to provide moisture content that will readily facilitate obtaining specified compaction with equipment used. Compact each layer to not less than percentage of maximum density specified below, determined in accordance with ASTM D1557, Method D. Insure that the compaction of previously prepared fill areas has been maintained prior to placing new layers.

AREA	PERCENTAGE
Under pavements and sidewalk areas, top 12 inches, each layer.	98
Under pavements and sidewalk areas, below 12 inches, each layer.	98
Under landscaped areas, each layer including all physical education fields	85

E. Reconditioning of Subgrade: Where approved compacted subgrades are disturbed by the Contractor's subsequent operations or adverse weather, subgrade shall be scarified and compacted as specified hereinbefore to required density prior to further construction thereon. Re-compaction over underground utilities shall be by power driven hand tampers.

F. Backfilling: Backfilling shall not begin until construction below finish grade has been accepted, underground utilities systems have been inspected, tested, and accepted, forms removed, and excavation cleaned of trash and debris. Backfill shall be brought to indicated finish subgrade. Backfill shall not be placed in wet areas. Backfill materials and compaction shall be as specified herein. Heavy equipment for spreading and compacting backfill shall not be operated closer to foundation or retaining walls than a distance equal to height of backfill above top of footing; area remaining shall be compacted by power-driven hand tampers suitable for material being compacted. Backfill shall be placed carefully around pipes to avoid damage.

G. Protection: Settlement or washing that occurs in backfilled areas prior to acceptance of work shall be repaired and grades re-established to required elevations and slope.

H. Backfill trenches with concrete where trench excavations pass within 18 inches of column or wall footings and that are carried below bottom of such footings or that pass under wall footings. Place concrete to level of bottom of adjacent footing.

I. Do not backfill trenches until tests and inspections have been made and backfilling is authorized by the Project Architect/Engineer. Use care in backfilling to avoid damage or displacement of pipe systems.

J. Backfill excavations as promptly as work permits, but not until completion of the following:

1. Inspection, testing and approval by UBC Inspectors, and recording locations of underground utilities have been performed and recorded.
2. Removal of shoring and bracing, and backfilling of voids with satisfactory materials. Cut off temporary sheet piling driven below bottom of structures and remove in manner to prevent settlement of the structure of utilities, or leave in place if required.
3. Removal of trash and debris from excavation.

3.14 GRADING

A. General: Uniformly grade areas within limits of grading under this section, including adjacent transition areas. Smooth finished surface within specified tolerances, compact with uniform levels or slopes between points where elevations are indicated or between such points and existing grades. Grading between indicated elevations and/or contours to be uniform, continuous and sloped as indicated on the drawings.

B. Grading Outside Building Lines: Grade areas adjacent to building lines to drain away from structures and to prevent ponding. Finish surfaces free from irregular surface changes as follows:

1. Lawn or Unpaved Areas: Finish areas to receive stockpiled topsoil to within not more than 0.10 foot above or below required subgrade elevations.
2. Walks: Shape surface of areas under walks to line, grade, and cross-section, with finish surface not more than 0.10 foot above or below required subgrade elevation.
3. Pavements: Shape surface of areas under pavement to line, grade and cross-section, with finish surface not more than ½ inch above or below required subgrade elevation.

C. Grading Surface of Fill under Building Slabs: Grade smooth and even, free of voids, compacted as specified, and to required elevation. Provide final grades within a tolerance of ½ inch when tested with a 10-foot straightedge.

D. Compaction: After grading, compact subgrade surfaces to the depth and indicated percentage of maximum or relative density for each classification.

3.15 PAVEMENT SUBBASE COURSE

A. General: Subbase course consists of placing subbase material, in layers of specified thickness, over subgrade surface to support a pavement base course.

1. Refer to Drawings and other Division 2 Paving and Subbase Sections for paving specifications.

B. Grade Control: During construction, maintain lines and grades including crown and cross-slope of subbase course.

C. Shoulders: Place shoulders along edges of subbase course to prevent lateral movement. Construct shoulders of acceptable soil materials, placed in such quantity to compact to thickness of each subbase course layer. Compact and roll at least a 12-inch minimum width of shoulder simultaneous with the compaction and rolling of each layer of subbase course.

D. Placing: Place subbase course material on prepared subgrade in layers of uniform thickness, conforming to indicated cross-section and thickness. Maintain optimum moisture content for compacting subbase material during placement operations.

1. When a compacted subbase course is indicated to be 6 inches thick or less, place material in a single layer. When indicated to be more than 6 inches thick, place material in equal layers, except no single layer more than 6 inches or less than 3 inches in thickness when compacted.

3.16 FILL AND GRADING FOR PHYSICAL EDUCATION PLAYING FIELDS AND OTHER GRASSED AREAS

A. Fill Material under P.E. Playing Fields and Other Grassed Areas: Clean, satisfactory fill, free from rock and debris and of such quality to not interfere with future installation of grass.

B. Filling and Grading for Playing Fields: Rough grade shall be 10 inches below finish grade in preparation for playing field fill which shall consist of:

1. Base: 4 inches of fine, compacted satisfactory fill material with no rocks larger than 2 inches, crowned and contoured as defined on the Plans.
2. Topping: 6 inches of top soil mix. Topping shall be 100% clean, well-draining

native yellow/orange sand, and shall be free from heavy clay, coarse sand, stones, lime, lumps, plants, roots, noxious weeds or other foreign materials.

3. Grass: As specified in SECTION 02204 - GRASSING BY SODDING or a related section within Division 2.

C. Filling and Grading for Other Grassed Areas: Establish rough and finish grades with clean native sands and top soils present on the site and then place the specified sod in accordance with its specification division.

D. Filling and Grading for Landscaped Areas other than Grass: Similar, with variations per specific plant material, as defined, illustrated and specified on the Landscape Plans.

3.17 FIELD QUALITY CONTROL

A. Specified Tests shall be performed by the Contractor's Testing Agency, at the Contractor's expense, with results forwarded to the Project Architect/Engineer for review.

B. Quality Control Testing During Construction: Allow testing service to inspect and approve each subgrade and fill layer before further backfill or construction work is performed.

C. Tests of Materials shall be as follows:

1. Soil Classification:
   a. One test from each type of material encountered and/or proposed to be used.
2. Laboratory Tests for Moisture Content and Density:
   a. According to ASTM D1557 one test for each material encountered and/or proposed.
3. Field Tests for Moisture Content and Density:
   a. According to ASTM D1556 one test per layer of fill per 10,000 square feet of area, plus one test per 10,000 square feet of subgrade in cut.
4. Control: Fill and topsoil mixture may be inspected at any stage of operation to determine compaction characteristics, densities and freedom from organic and plastic materials.

D. Perform field density tests in accordance with methods listed in Item C.

1. Footing Subgrade: For each strata of soil on which footings will be placed, perform at least one test to verify required design bearing capacities. Subsequent verification and approval of each footing subgrade may be used on a visual comparison of each subgrade with related tested strata when acceptable to the Project Architect/Engineer.
2. Paved Areas and Building Slab Subgrade: Perform at least one field density test

of subgrade for every 2,000 sq. ft. of paved area or building slab, but in no case fewer than three tests. In each compacted fill layer, perform one field density test for every 2,000 sq. ft. of overlaying building slab or paved area, but in no case fewer than three tests.

3. Foundation Wall Backfill: Perform at least two field density tests at locations and elevations as directed.
4. If in the opinion of the Project Architect/Engineer, and based on testing service reports and inspections, any subgrade or fills that have been placed which are below specified densities shall require additional compaction and testing until the specified density is obtained.

E. Notification:
1. Give sufficient notification of placing orders for fill and topsoil with supplier to permit full inspection including testing for compaction characteristics at source of supply.
2. Obtain approval from Project Architect/Engineer before placing topsoil mixture at project site, without exception.

3.18 EROSION CONTROL

A. Provide erosion control methods in accordance with requirements of the project. Repair and re-establish grades to required elevations and slopes where erosion has occurred prior to Owners acceptance of the work.

B. The Contractor shall install erosion control methods adjacent to any lakes, ditches and/or wetlands which are adjacent to the project site whereby the quality of such would be degraded by runoff, erosion and sedimentation.

3.19 MAINTENANCE

A. Protection of Graded Areas: Protect newly graded areas from traffic and erosion. Keep free of trash and debris.

B. Repair and re-establish grades in settled, eroded, and rutted areas to specified tolerances.

C. Reconditioning Compacted Areas: Where completed compacted areas are disturbed by subsequent construction operations or adverse weather, scarify surface, reshape, and compact to required density prior to further construction.

D. Settling: Where settling is measurable or observable at excavated areas during general project warranty period in the opinion of the Project Architect/Engineer, the Contractor shall remove surface (pavement, lawn, or other finish), add backfill material, compact, and replace surface treatment. Restore appearance, quality, and condition of surface or finish to match adjacent work, and eliminate evidence of restoration to greatest extent possible.

3.20 DISPOSAL OF EXCESS AND WASTE MATERIALS

A. Removal from Owner's Property: Contractor shall remove waste materials, including unacceptable excavated material, trash, and debris, and dispose of it off of Owner's property at a landfill or equivalent site, approved by the local Government Authorities.

*****END OF SECTION*****

SECTION 02202- EXCAVATION

1.01 SCOPE

A. The Contractor shall furnish labor, equipment, and transportation to excavate and haul material in accordance with the Plans and Specifications.

2.01 GENERAL

A. The Contractor shall excavate for the roadways, structures, swales, etc., as shown on the Drawings and specified herein, and shall dispose of all materials excavated, at a site designated or approved by the Owner.

3.01 DISPOSAL

A. In all areas where excavation is to be done, all earth, rock, muck and other materials shall be removed and separated as to suitable and unsuitable material for backfill as defined herein.

B. The Contractor may, for his own convenience, elect to temporarily stockpile any portion of the excavated material at a job site location designated by the Owner, for later use or disposal. The stockpiled material shall be piled in an orderly manner so as not to endanger the work or obstruct roadways or drainage within the designated job site location. All excavated unsuitable material shall be disposed of at a location designated or approved by the Owner. All excavated suitable material that is not reused by the Contractor within the job site shall become the property of the Owner and shall be disposed of, at the Contractor's expense, as directed by the Owner.

4.01 SHEETING AND BRACING

A. Where excavations may endanger workmen, existing structures, utilities or other facilities, it shall be the Contractor's responsibility to immediately install and maintain adequate sheeting and bracing per OSHA specifications in order to protect said facility. No work shall proceed in such excavations until the sheeting and bracing has been properly and completely installed. The sheeting thus installed shall be removed as the work progresses or, at the discretion of the Site Engineer, be cut off below finished grade and left in place. Sheeting and bracing may be either steel or wood at the option of the Contractor.

B. Sheeting and bracing shall be installed in a manner that will allow for removal without injuring or endangering workmen, the work, adjacent structures, and the like. Voids caused by withdrawal of sheeting shall be promptly and completely filled with sand and compacted to a degree equal to the surrounding soil.

5.01 DEWATERING

A. All water encountered during excavation shall be promptly and completely removed to a depth below the exposed excavation surface sufficient to provide a dry working surface. The excavation shall be kept dry until the work to be built or placed therein has been completed as specified. Dewatering shall be done in a manner that will not cause sloughing or caving of the excavation walls. Water from said dewatering shall be disposed of in a manner as will not result in violations of State water quality standards in receiving waters, nor cause injury to public health nor to public or private property, nor to the work completed or in progress. Any and all damage caused by dewatering shall be promptly repaired by the Contractor, at no cost to the Owner. The receiving point for water from said operation shall be approved by the applicable regulatory agency and the Engineer. The Contractor is responsible for obtaining all required permits and any other approval necessary.

6.01 REMOVAL OF MUCK, ROCK, AND OTHER UNSUITABLE MATERIAL

A. All muck, rock, clay, marl, gravel, boulders, heterogeneous fill material and any other organic or unsuitable "materials of excavation" encountered under pavement areas, structures and utilities shall be excavated and removed. Also, any "unforeseen obstacles" such as buried trees or timbers, abandoned utilities, metal objects, concrete masses, or any other type of debris encountered shall be removed.

B. Stripping shall be accomplished to clean in-place sand or other suitable material as approved by the Engineer. Removal of unsuitable material within areas which are to receive footings, slabs or other foundations shall be completed for the full area under such structures and to and to ten feet minimum outside the maximum perimeter. Where pavement is to be placed, said removal shall include all areas under the surface and extend to the outside of shoulders and under sidewalks and bike paths, or as directed by the Engineer.

C. All roots, stumps, logs, limbs, timbers, boulders, or any material which is not suitable for backfill material shall be removed from the site promptly and excavated and disposed of by the Contractor at his expense.

D. All "materials of excavation" and "unforeseen obstacles" will be considered as incidental to construction and no additional compensation will be allowed with the exception of the following:
    1) Rock
    2) Boulders
    3) Utility Lines (active or inactive)
    4) Large metal objects (in excess of 100 pounds each)
    5) Concrete Masses such as sign bases, pole bases, etc.

*****END OF SECTION*****

SECTION 02203 - GENERAL & SELECT FILL, FILTER MATERIAL, BACKFILL AND COMPACTION

1.01 SCOPE

A. The Contractor shall furnish all of the material, equipment, plant, labor, transportation and supervision necessary so as to complete the Work as shown on the Plans and specified herein.

2.01 GENERAL

A. Where structures or unsuitable material have been removed, suitable backfill or fill material shall be provided, placed and compacted to elevate the site to the finish grade as shown on the grading plans. Pre-fill compaction shall be accomplished prior to this operation, as specified herein.

3.01 MATERIAL

A. General Fill - All humus, peat, spongy material, roots, stumps, muck, paving materials, and other objectionable materials shall be unsuitable for backfill. Suitable material for backfill shall consist of sandy-loam, clayey-sand, sand, gravel, soft shale, or crushed stone. The Civil Engineer shall be the sole judge of what constitutes suitable and unsuitable material for backfill other than those materials listed above.

B. Select Fill - Shall consist of uniform, clean, free draining sand, containing less than 3% fines passing a No. 200 sieve. Laboratory test results of this fill shall be submitted to the Civil Engineer for his approval.

C. Filter Material - Shall consist of a washed sand containing less than 1% fines passing a No. 200 sieve and must have a uniformity coefficient of 1.5 or greater but not more than 4.0. Effective grain size shall be between 0.20 and 0.55 millimeters diameter.

4.01 BORROW

A. If there is not sufficient excavated material of a suitable quality to complete the work, the Contractor shall provide and deliver the necessary suitable additional material to the job site.

5.01 UNSUITABLE MATERIAL REPLACEMENT

A. Fill material shall be placed and spread evenly in layers not to exceed eight inches before compaction. All fill material shall be free from vegetable matter, wood, and other deleterious substances, and shall not contain rocks or clods having a diameter of more than three inches.

B. If soil cement paving is proposed, local yellow sand or hard pan shall not be used for the subgrade nor in the base.

6.01 PRE-FILL COMPACTION

A. Should the pre-fill surface elevation be below that required for the base of the proposed building foundations or paving subgrade, the areas within road rights-of-ways, under parking areas, and the areas under and within five feet of proposed buildings shall be precompacted. This precompaction shall be performed equally on existing ground and on surfaces which have been excavated to remove unsuitable material. The top two feet of said areas shall be compacted to a minimum density of 95% of maximum as determined by AASHTO T-180. The maximum spacing between density tests shall be 150 feet.

7.01 COMPACTION

A. Backfill material shall be compacted to 95% of maximum density per AASHTO T-180. Equipment suitable and adequate for uniform compaction to the specified density shall be used for backfill operations subject to the approval of the Civil Engineer. All compaction equipment shall be in good working order and any worn or defective equipment shall be immediately replaced or repaired.

8.01 SOIL STABILITY AND COMPACTION CONTROL

A. The Contractor shall arrange to have sufficient soil tests made by an independent testing laboratory selected by the Civil Engineer to demonstrate conformance of his work with the stability and compaction levels required by these specifications. Compaction tests shall be taken at intervals listed herein or as deemed necessary by the Civil Engineer.

B. Any proposed alternative test methods to those specified herein must be approved by the Civil Engineer prior to testing. At the request of the Civil Engineer, the Contractor shall provide such documentation of a proposed alternative test method as the Civil Engineer may require to evaluate the method for approval.

C. In no case shall the Contractor proceed with construction on compacted material until the tests prove satisfactory and approval is given by the Civil Engineer.

D. In general, at least one test for maximum dry density/optimum moisture content shall be performed on a representative sample of each inherently different material to be used for compacted backfill or embankment fill. For material of uniform composition and textural class, a minimum of one test per 200 cu. yd. Of material shall be performed at the point of use. Provide testing to establish the acceptance of natural soil under footings.

E. Tests for in-place density (percent compaction) shall be taken at locations designated by the Civil Engineer.

*****END OF SECTION*****

SECTION 02204 - GRASSING BY SODDING

1.01 SCOPE

A. The Contractor shall furnish all materials, labor, equipment and supervision required to prepare the soil, fine grade the area and establish a healthy stand of grass by sodding of the areas so designated on the drawings and as specified herein.

2.01 GENERAL

A. PREPARATION

1. The area to be sodded shall be clear of old sod and weeds. The area shall be fine graded and the surface loosened, by scarifying, if necessary. If the soil is dry it shall be moistened to provide an optimum growing condition.

B. FERTILIZER

1. Fertilizer shall be uniformly spread over the area to be sodded at the rate of 400 to 500 pounds per acre. The fertilizer shall have a chemical designation of 12-8-8. Soil which has a PH of 5.0 or lower shall, if directed by the Engineer, have an application of dolomite lime stone, but the amount of dolomite applied shall not raise the PH above 6.0.

C. SOD

1. The sod shall be **St. Augustine Floratam** and/or **Argentine Bahia** as specified on the plans or directed by the Engineer. The sod shall be of a tough texture with a good mat of roots. It shall be free of weeds and other objectionable grasses. Approximately three days prior to cutting the sod, it shall be closely mowed and raked to remove excess growth and debris. The sod shall be cut with sufficient thickness to retain the root system intact. There shall be a minimum of delay between the cutting of the sod and the laying so that it is live, fresh and uninjured when laid.

D. LAYING

1. No sod shall be laid until the Owner/Engineer has approved the condition of the prepared area. The sod shall be placed with the edges in close contact. Where the sod is laid on a slope the pieces of sod shall be laid with staggered joints to minimize erosion along the joints and where the sod is laid in drainage swales and ditches the joints shall be staggered in the line of flow for the same reason. After the sod is laid it shall be brought into close contact with the soil by tamping, light rolling or other acceptable means. Where the sod may slide due to the steep slope it shall be pegged to firm soil with wood

pegs.

E. WATERING

1. The sod shall be kept watered on an as needed basis for the duration of the contract period and in no case for less than two weeks. When the grass is watered it should be at the rate of one inch or 620 gallons per 1000 square feet per application. **NOTE: In the event there is no irrigation system in the area to receive the sod, the Contractor is responsible for pulling hoses from existing hose bibs or water source in the area, for irrigating and maintaining the sod. The cost of the water will be incurred by the Contractor.**

F. MAINTENANCE

1. The Contractor shall, at his expense, maintain the sodded area in a satisfactory condition until final acceptance of the project or until the end of the two weeks watering period, whichever is later, (see paragraph E above). Such maintenance shall include the filling, leveling and repair of any washed or eroded areas and the resodding of any areas which have been damaged or are not growing satisfactorily.

*****END OF SECTION*****

SECTION 02206 - SITE CLEANUP & RESTORATION

1.01 SCOPE

A. The Contractor shall furnish all labor, equipment, appliances and materials required or necessary to clean up the site after the construction is completed and to restore items disturbed or damaged due to his construction operation.

2.02 GENERAL

A. During the progress of the project, the work and the adjacent areas affected thereby shall be kept in a neat and orderly condition. All rubbish, surplus materials, and unused construction equipment shall be removed. All damage shall be repaired so that the public and private property owners will be inconvenienced as little as possible.

B. Where material or debris has been deposited in watercourses, ditches, gutters, drains, or catch-basins as a result of the Contractor's operations, such material or debris shall be entirely removed and satisfactorily disposed of during the progress of the work, and the ditches, channels, drains, etc., shall be kept clean.

C. Before the completion of the project, the Contractor shall, unless otherwise especially directed or permitted in writing, tear down and remove all temporary buildings and structures which he builds; remove all temporary works, tools, and machinery or other construction equipment furnished by him; remove, acceptably disinfect, and cover all organic matter and material containing organic matter in, under, and around privies, houses, and other buildings used by him; remove all rubbish from any grounds which he has occupied; and leave the roads, all parts of the premises and adjacent property affected by his operations, in a neat and satisfactory condition.

D. It shall be the responsibility of the Contractor to repair, rebuild, or restore to its former conditions, any and all portions of existing utilities, structures, equipment, appurtenances, trees and shrubs, or facilities, other than those to be paid for under the specifications, which may be disturbed or damaged due to his construction operations.

E. The Contractor shall thoroughly clean all materials and equipment installed by him and his subcontractors and on completion of the work shall deliver the facilities undamaged and in fresh and new-appearing condition.

*****END OF SECTION*****

SECTION 02250 - SOIL POISONING

A. Compound application shall be done by an established and certified pest control organization as per Section 815-3.8 of Section 815 of the Minimum Property Standards for 1 & 2 living units, FHA/VA and the Department of Pesticide Regulation.

B. Products applied must comply with Chapter 487, F.S. and the registered label contains directions for use on new construction. All applied products shall have an active EPA registration number.

C. The Contractor shall furnish the Owner with a written guarantee stating the concentration of the poison utilized, the rate and the method of application. The guarantee shall be for a period of not less than five (5) years, with the cost for a five (5) year inspection and protection program to be included in the base bid.

D. The Contractor shall not begin soil treatment until such time as the subgrade preparation is completed and ready for the vapor barrier or vapor retarder installation.

E. The below listed chemicals are **toxic** to plant and animal life and are to be applied, with due caution, only by experienced personnel. Apply to those areas to be treated, one (1) of the following chemicals, at not less than the designated concentration applied in a water emulsion.

1. **Dursban TC** 1%
2. **Probuild TC** 1%
3. **Premise** 1%
4. **Termidor** 1%.

F. Apply an overall treatment of toxicant, at a rate of one (1) gallon per ten (10 square feet, under the entire area of the building floor slab and to a distance of 5'-0" beyond the building perimeter where it is abutted by a slab/walkway or paving. Apply additional toxicant, at a rate of two (2) gallons per lin. ft., to expansion joints and where the floor slab is penetrated by floor drains, plumbing risers, electrical conduits or HVAC sleeves and chases.

G. Do not apply at a lower dosage and/or concentrations than specified on the label for application prior to installation of the finished grade. Prior to each application, applicators shall notify the general contractor or construction superintendent, of the intended termiticide application and intended sites of application and instruct the responsible person to notify all workers to leave the area to be treated until the termiticide is absorbed into the soil.

*****END OF SECTION *****

SECTION 02516 - SITE CONCRETE (WALKS & SLABS)

PART 1 - GENERAL

The drawings and general provisions of Contract, including General and Supplementary conditions and Division 1 -- Specifications Sections, apply to work of this Section.

1.01 DESCRIPTION

A. Extent of Portland cement concrete paving, walks and slabs are shown on the drawings.

B. Prepared subbase is specified in "Earthwork" Section.

C. Concrete and related sections are specified in Division 3.

D. Joint fillers and sealers are specified in Division 7.

1.02 QUALITY ASSURANCE

A. Codes and Standards:
Comply with local governing regulations if more stringent than herein specified.

1.03 SUBMITTALS

A. Furnish samples, manufacturer's product data, test reports, and materials, certifications as required in referenced sections for concrete and joint fillers.

1.04 JOB CONDITIONS

A. Traffic Control:
Maintain access for vehicular and pedestrian traffic as required for other construction activities.

B. Utilize barricades, warning signs and warning lights as required.

PART 2 – PRODUCTS

2.01 MATERIALS

A. Forms:
Steel, wood or other suitable material of size and strength to resist movement during concrete placement and to retain horizontal and vertical alignment until removal. Use straight forms, free of distortion and defects. Use flexible spring steel forms, masonite or laminated boards to form radius bends as required.

B. Coat forms with a non-staining form release agent that will not discolor or deface surface of concrete.

C. Reinforcing:

Utilize Fibermesh admixture.

D. Concrete Materials:
Comply with requirements of applicable Division 3 Sections for concrete materials, admixtures, bonding materials, curing materials, and others as required.

2.02 CONCRETE MIX, DESIGN AND TESTING

A. Design mix to produce standard-weight concrete consisting of portland cement, 3/4" aggregate, air-entrained admixture and water to produce the following properties:

1. Compressive Strength: 2,500 psi minimum at 28 days.
2. Slump Range: 4" plus/minus 1" slump.
3. Air Content: 5% to 8%.
4. Water reducing or other supplemental admixtures will not be allowed.
5. Pea rock pump-mix will not be allowed for any slabs on grade.

PART 3 – EXECUTION

3.01 SURFACE PREPARATION

A. Remove loose material from compacted subbase surface immediately before placing concrete.

B. Proof-roll prepared subbase surface to check for unstable areas and need for additional compaction. Do not begin paving work until such conditions have been corrected and are ready to receive concrete.

C. Set forms to required grades and lines, rigidly braced and secured. Install sufficient quantity of forms to allow continuous progress of work and so that forms can remain in place at least 24 hours after concrete placement.

D. Check completed form work for grade and alignment to following tolerances:
1. Top of forms not more than 1/8" in 10'.

2. Vertical face on longitudinal axis, not more than 1/4" in 10'.

3. Clean forms after each use, and coat with form release agent as often as required to ensure separation from concrete without damage.

3.02 CONCRETE PLACEMENT:

A. General:
Comply with requirements of Division 3 sections for mixing and placing concrete, and as herein specified.

B. Do not place concrete until subbase and forms have been checked for line and grade. Moisten subbase if required to provide a uniform dampened condition at time concrete is placed. Do not place concrete around manholes or other structures until

they are at required finish elevation and alignment.

C. Place concrete using methods which prevent segregation of mix. Consolidate concrete along face of forms and adjacent to transverse joints with internal vibrator. Keep vibrator away from joint assemblies, reinforcement, or side forms. Use only square-faced shovels for hand-spreading and consolidation. Consolidate with care to prevent dislocation of reinforcing, dowels, and joint devices.

D. Deposit and spread concrete in a continuous operation between transverse joints, as far as possible. If interrupted for more than ½ hour, place a construction joint. Do not use concrete pumps unless they are capable of delivering 3/4" rock mix.

3.03 JOINTS:

A. General:
Construct expansion, weakened-plane (contraction), and construction joints true-to-line with face perpendicular to surface of concrete. Construct transverse joints at right angles to the centerline, unless otherwise indicated.

B. Tooled Joints:
Form weakened-plane joints in fresh concrete by grooving top portion with a recommended cutting tool and finishing edges with a jointer.

C. Construction Joints:
Place construction joints at the end of pours and at locations where placement operations are stopped for a period of more than ½ hour, except where such pours terminate at expansion joints.

D. Sawcut Control Joints shall be cut a minimum of 1" deep within 24 hours of concrete placement and located per drawings.

3.04 CONCRETE FINISHING

A. After striking-off and consolidating concrete, smooth surface by screeding and floating. Use hand methods only where mechanical floating is not possible. Adjust floating to compact surface and produce uniform texture.

B. After floating, test surface to trueness with a 10' straightedge. Distribute concrete as required to remove surface irregularities, and refloat repaired areas to provide a continuous smooth finish.

C. Work edges of slabs, back top edge of curb, and formed joints with an edging tool, and round to ½" radius, unless otherwise indicated. Eliminate tool marks on concrete surface.

D. After completion of floating and when excess moisture or surface sheen has disappeared, complete surface finishing as follows:

1. Broom finish, by drawing a fine-hair broom across concrete surface, perpendicular

to line of traffic. Repeat operation if required to provide a fine line texture acceptable to Architect.

E. Do not remove forms for 24 hours after concrete has been placed. After form removal, clean ends of joints and point-up any minor honey-combed areas. Remove and replace areas of sections with major defects, as directed by Architect.

3.05 CURING

A. Protect and cure finished concrete paving, complying with applicable requirements of Division 3 sections. Use moist-curing methods for initial curing whenever possible.

3.06 REPAIRS AND PROTECTION

A. Repair or replace broken or defective concrete, as directed by Architect.

B. Drill test cores where directed by Architect, when necessary to determine magnitude of cracks or defective areas. Fill drilled core holes in satisfactory pavement areas with portland cement concrete bonded to pavement with epoxy resin grout.

C. Protect concrete from damage until acceptance of work. Exclude traffic from pavement for at least 14 days after placement. When construction traffic is permitted, maintain pavement as clean as possible by removing surface stains and spillage of materials as they occur.

D. Sweep concrete pavement and wash free of stains, discolorations, dirt and other foreign material just prior to final inspection.

*****END OF SECTION*****

SECTION 03100 - CONCRETE FORMWORK

PART 1 - GENERAL

1.01 QUALITY ASSURANCE

A. Qualifications of Workmen:

1. Provide at least one person who shall be present at all times during execution of this portion of the work and who shall be thoroughly familiar with the type of materials being installed, the referenced standards, and the requirements of this work, and who shall direct all work performed under this Section.

B. Codes and Standards:

1. Comply with applicable provisions of the latest edition of Building Code that has jurisdiction and Occupational Safety and Health Act.

2. Where provision of pertinent codes and standards conflict with the requirements of this Section of these Specifications, the more stringent provisions shall govern.

3. Product Standard PS 1-83 for Construction and Industrial Plywood.

4. American Concrete Institute Standard recommended practice for concrete formwork, ACI 347-latest edition.

PART 2 - PRODUCTS

2.01 FORM MATERIALS

A. Form Lumber:

1. All form lumber in contact with exposed concrete shall be new except as allowed for under Re-use of Forms in Part 3 of this Section of the Specifications. All form lumber shall be one of the following, a combination thereof, or an equal approved in advance by the Engineer.

a. "Plyform", Class I 5/8" or 3/4" PS 1066, C-D exterior plywood, bearing the label of the Douglas Fir Plywood Association.

b. Douglas Fir-Larch, number two grade, seasoned, surfaced four (4) sides.

2.02 OTHER MATERIALS

A. All other materials, not specifically described but required for proper completion of concrete formwork, shall be as selected by the Contractor subject to the advance approval of the Engineer.

PART 3 - EXECUTION

3.01 SURFACE CONDITIONS

A. Inspection and Soil Treatment:

1. Prior to all work of this section, carefully inspect the installed work of all other trades and verify that all such work is completed to the point where this installation may properly commence.

2. Verify that forms may be constructed in accordance with all pertinent codes and regulations, the referenced standards, and the original design.

3. Treat underlying soil to prevent vegetation growth and insect infestation.

3.02 CONSTRUCTION OF FORMS

A. General:

1. Construct all required forms to be substantial, sufficiently tight to prevent leakage of mortar, and able to withstand pressures without excessive deflection when filled with wet concrete.

B. Embedded Items:

1. Set all required steel frames, angles, grilles, bolts, inserts, and other such items required to be anchored in the concrete before the concrete is placed.

C. Bracing:

1. Properly brace and tie the forms together so as to maintain position and shape and to ensure safety to personnel.

2. Construct all bracing and supporting members of amply size and strength to safely carry, without excessive deflection, all dead and live loads to which they may be subjected.

3. Space the forms the proper distance apart and securely tie them together, using metal spreader ties that provide positive tying and accurate spreading.

3.03 RE-USE OF FORMS

A. General:

1. Re-use of forms shall be subject to advance written approval of the Structural Engineer or his designer.

B. Requirements:

1. Except as specifically approved in advance by the Structural Engineer, re-use of forms shall in no way delay or change the schedule of placement of concrete from the schedule obtainable if all form were new.

2. Except as specifically approved in advance by the Structural Engineer, re-use of forms shall in no way impart less structural stability to the forms no less acceptable appearance to finished exposed concrete.

3.04 REMOVAL OF FORMS

A. General:

1. Minimum periods to form removal after concrete placement shall be as follows:

Slabs and curbs	24 hours
Vertical walls (4'-0" Ht.)	36 hours
Vertical walls (over 4'-0" Ht.)	7 days

2. Removal of formwork may be extended if deemed necessary by the Structural Engineer.

B. Removal:

1. Remove metal spreader ties on exposed concrete by removing or snapping off inside the wall surface and point up and rubbing the resulting pockets to match the surrounding areas.

2. Flush all holes resulting from the use of spreader rods and sleeve nuts, using water, and then solidly pack throughout the wall thickness with cement grout applied under pressure by means of a grouting gun; grout shall be one (1) part Portland cement and two and one-half (2-1/2) parts sand; apply grout immediately after removing forms.

*****END OF SECTION*****

SECTION 03200 - CONCRETE REINFORCEMENT

PART 1 - GENERAL

1.02 QUALITY ASSURANCE

A. Qualifications of Workmen

1. Provide at least one person who shall be present at all times during execution of this portion of the Work and who shall be thoroughly familiar with the type of materials being installed and the best methods for their installation and who shall direct all Work performed under this Section.

B. Codes and Standards

1. Comply with applicable provisions of the latest edition of the Florida Building Code that has jurisdiction.

2. Where provisions of pertinent codes and standards conflict with this Specification, the more stringent provisions shall govern.

1.03 SUBMITTALS

A. Shop Drawings

1. Within thirty-five (35) days after award of Contract, and before any concrete reinforcement materials are fabricated and/or delivered to the job site, submit (4) four sets of Shop Drawings to the Architect.

2. Do not fabricate and/or deliver concrete reinforcement to the job site until receipt of Shop Drawings review and approval from the Architect.

1.04 PRODUCT HANDLING

A. Protection

1. Use all means necessary to protect concrete reinforcement before, during, and after installation and to protect the installed work and materials of all other trades.

2. Store in a manner to prevent excessive rusting and fouling with dirt, grease, and other bond-breaking coatings.

B. Placements

In the event of damage, immediately make all repairs and replacements necessary to the approval of the Architect and at no additional cost to the Owner.

PART 2 - PRODUCTS

2.01 CONCRETE REINFORCEMENT

A. All concrete reinforcement materials shall be new, free from rust, and complying with the following reference standards unless otherwise specified on the drawings.

1. Bars for reinforcement: "Specifications for Deformed Billet-Steel Bars for Concrete Reinforcement", ASTM A-615, latest editions, Grade 60.

2. Wire for reinforcement: "Specifications for Cold-Drawn Steel Wire for Concrete Reinforcement", ASTM A-82.

3. Wire fabric: "Specifications for Wire Fabric for Concrete Reinforcement", ASTM A-185, latest edition. Carefully review the structural drawings for sizes of specified wire fabrics. Do not confuse standard 6X6 10/10 WWF (a rolled product) with specific 6X6 6/6 "road mesh" (a sheet product).

2.02 OTHER MATERIALS

A. All other materials, not specifically described but required for a complete and proper installation of concrete reinforcement, shall be as selected by the Contractor subject to the approval of the Architect.

2.03 LEED REQUIREMENTS FOR RECYCLED MATERIAL

A. All reinforcing steel shall be a minimum of 90% recycled as manufactured by utilizing an electric arc furnace (EAF). Manufacturer shall provide documentation clarifying the percentages of post-consumer and pre-consumer recycled content. Manufacturer shall be located within 500 miles of the site.

PART 3 - EXECUTION

3.01 SURFACE CONDITIONS

A. Inspection

1. Prior to installation of the Work of this Section, carefully inspect the installed work of all other trades and verify that all such work is complete to the point where this installation may properly commence.

2. Verify that concrete reinforcement may be installed in strict accordance with all pertinent codes and regulations, the approved Shop Drawings, and the original design.

B. Discrepancies

1. In the event of discrepancy, immediately notify the Architect.

2. Do not proceed with installation in areas of discrepancy until all such discrepancies have been fully resolved.

3.02 BENDING

A. General

1. Fabricate all reinforcement in strict accordance with the approved Shop Drawings and ASTM A-615.

2. Do not use bars with kinks or bends not shown on the Drawings or on the approved Shop Drawings.

3. Do not bend or straighten steel in a manner that will injure the material.

3.03 PLACING

A. General

1. Before the start of concrete placement, accurately place all concrete reinforcement, positively securing and supporting by means of approved metal chairs, spacers, and metal hangers.

B. Clearance

1. Preserve clear space between bars of not less than one and one-half (1-1/2) times the nominal diameter of round bars.

2. Provide minimum concrete covering of reinforcement as shown or noted on the Structural Drawings.

3.04 CLEANING REINFORCEMENT

A. Steel reinforcement, at the time concrete is placed around it, shall be free from rust scale loose mill scale, oil paint, and all other coatings which will destroy or reduce the bond between steel and concrete.

*****END OF SECTION*****

SECTION 03300 - CAST IN PLACE CONCRETE

PART 1 - GENERAL

1.01 RELATED WORK SPECIFIED ELSEWHERE

A.	Concrete Formwork	Section 03100
B.	Concrete Reinforcement	Section 03200
C.	Unit Masonry	Section 04200
D.	Underslab Vapor Retarder	Section 07160
E.	Metal Building Systems	Section 13122
F.	Plumbing	Section 15000
G.	Electrical	Section 16000

1.02 QUALITY ASSURANCE

A. ASTM Standards (Latest Editions):

1. C-31 Standard Method of Making and Curing Concrete Test Specimens in the Field

2. C-33 Standard Specification for Concrete Aggregates

3. C-39 Standard Test Method for Compressive Strength of Cylindrical Concrete Specimens

4. C-42 Standard Method of Obtaining and Testing Drilled cores and Sawed Beams of Concrete

5. C-94 Standard Specification for Ready Mixed Concrete

6. C-143 Standard Test Method for Slump of Portland Cement Concrete

7. C-150 Standard Specification for Portland Cement

8. C-172 Standard Method of Sampling Freshly Mixed Concrete

B. ACI standards (Latest Editions):

1. ACI-318, Building Code Requirements for Structural Concrete

2. Concrete work shall conform to all requirements of ACI-301 (Latest Editions), Specifications for Structural Concrete for Buildings, except as modified by the supplemental requirements herein.
3. ACI 318 Detailing Standards.

4. ACI 315 Specifications for structural Concrete for Buildings

5. CRSI 347R Recommended Practice for Placing reinforcing bars.

1.03 TESTS AND INSPECTIONS

A. All tests shall be made in accordance with ASTM recommendations referred to herein.

B. Tests shall be performed by an independent laboratory approved by the Architect.

C. Contractor will pay for testing, including tests which indicated failure; in which case that test and all costs incurred as a result thereof, shall be paid for by the Contractor.

D. Standard slump tests shall be taken of the concrete sample for each strength test and whenever consistency of concrete appears to vary. The maximum slump of concrete shall be 4" plus/minus 1", unless specifically otherwise noted.

E. Concrete that fails by test shall be replaced at no cost to Owner.

F. Test for strength shall be made as follows:

1. **Slump Test:** One test for each load of concrete at the point of discharge taken out of a wheelbarrow and not out of the chute. Maximum slump measurements as stated above.

2. **Compressive Strength Test:** Randomly test cylinders taken at each major pour; footings, floor slabs, columns and tie-beams. Two (2) specimens are to be tested at 7 days and two (2) specimens tested at 28 days. Hold one cylinder for future use if test does not comply at 28 days.

3. All test results are to be reported, in writing, to the Owner, and the Architect. Test results should stipulate the day the tests were performed.

4. Samples for testing shall be taken at 1/4 and 3/4 points of the load discharged from the mixer.

5. If necessary, comply with Architect or Engineer's request for additional cylinders, slump or load test.

PART 2 - PRODUCTS

2.01 CONCRETE

A. Cement shall be Portland cement, ASTM C-150.

B. Aggregates for normal weight concrete shall meet the requirements of ASTM C-33.

C. Mixing water for concrete shall be potable and meet the requirements of ASTM C-94.

2.02 ACCESSORIES

A. Anchor slots, reglets and inserts of type, size and spacing required by trades involved, and shown on plans.

B. Vapor Barrier: 6 mil Polyethylene Film, such as "visqueen". Refer to the Building Plan Sections for specific applications.

C. Vapor Retarder: 10 mil vapor retarder such as Perminator by WJ Meadows. Refer to the Building Plan Sections for specific applications.

D. Chemical Curing Compound: Application of a curing compound shall be made to all slabs and such application shall conform to ASTM C-309. The compound shall be applied in accordance with the recommendations of the manufacturer immediately after any water sheen which may develop after finishing has disappeared from the concrete surface. It shall not be used on any surface against which additional concrete or other material is to be bonded unless it is proven that the curing compound will not prevent bond, or unless positive measures are taken to remove it completely from areas to receive bonded applications.

Acceptable materials shall be one of the following:

1. Burke Company — Aqua resin Cure
2. Sika Corporation — Sikagard Cure/Hard
3. Sonneborn — Hydrocide

E. Expansion Joint Water Stops: Continuous, pre-formed, finned, center bulb type, polyvinyl chloride, of sufficient width to provide 3" minimum embedment in concrete each side. Equal to Greenstreak #703.

F. Pre-molded Joint Filler: Bituminous Fiber Type, ASTM D-1751-83 and D 545-77 equal to "Celotex Flexcell" of thickness and width indicated or required.

G. Reinforcement shall be cleaned of all scale and excessive rust. All reinforcement shall be set with the standard accessories as per ACI 315-74. Minimum coverage of reinforcement shall be as follows:

1. Footings – 3" minimum.
2. Slabs – ¾" minimum.
3. Beams and Columns – 1-1/2" minimum.

PART 3 - EXECUTION

3.01 PROPORTIONING AND MIXING

A. Concrete Mix:

1. All cast-in-place concrete shall be ready mixed and in accordance with ASTM Specifications C-94 (Latest Edition).

2. Minimum 5 bags cement per yard of concrete.

B. Concrete Strength:

1. Unless specifically noted otherwise, all concrete shall have a minimum compressive strength of f'c = 3000 psi.

2. A design mix shall be prepared by a Florida Registered Professional Engineer employed by the concrete supplier.

3. The Contractor shall submit to the Architect/Engineer the concrete materials and the concrete mix designs proposed for use with a written request for acceptance. This submittal shall include the results of all testing performed to qualify the materials and to establish the mix designs.

C. Job Tempering:

1. All Concrete shall be placed within 1½ hours after introduction of water to the mix.

2. Under no condition may additional water be added that exceeds the allowable gallons stipulated on the batch ticket.

3. Submit time stamped batching tickets on delivery of concrete to job site.

4. All concrete where water has been added will be removed and replace with proper concrete at no cost to the Owner.

5. When air temperature is between 85 and 90 degrees **F**, reduce mixing and delivery time to 75 minutes. When air temperature is higher than 90 degrees, reduce mixing and delivery time to 60 minutes.

3.02 PLACING OF CONCRETE

A. Review: No concrete shall be placed until all reinforcing steel, pipes, sleeves, inserts, etc. have been set in place and reviewed by the Owner's representative. **Contractor shall notify the Architect of scheduled pours 24 hours prior to pouring.**

B. Placing: Concrete shall be placed in properly cleaned and prepared forms in accordance with the requirements of ACI-301. Concreting should be carried on at such a rate that the concrete is at all times plastic.

C. Conveying: Concrete shall be handled from the mixer to the place of final deposit as rapidly as practicable by methods which will prevent segregation or loss of ingredients and in a manner which will assure that the required quality of the concrete is maintained. All other requirements of ACI-301 shall be followed.

D. Depositing: Concrete shall be deposited continuously or in layers of such thickness that no concrete will be deposited on concrete which is hardened sufficiently to cause the formation of seams or planes of weakness within the section.

E. Consolidation: All concrete shall be consolidated by vibration, spading, rodding, or forking so that the concrete is thoroughly worked around the reinforcement, around embedded items, and into corner of forms eliminating all air or stone pockets which may cause honeycombing, pitting, or planes of weakness.

F. All slabs on grade are to be Regular ¾ rock concrete at 3000 psi ultimate strength at 28 days. NO PUMP MIX (pea rock) WILL BE ACCEPTED for any slab on prepared grade. This does not prohibit the pumping of the regular ¾ rock mix.

3.03 JOINTS

A. Construction Joints:

1. Locate as shown on the drawings or near points of minimum shear and as approved by Architect/Engineer for beam or slabs. Construction joints shall be straight saw-cut by a walk behind motorized saw, tooled, mechanical or actual cold joints as called out on the plans.

2. Locate joints in vertical members, walls at underside of floors or beams, and at tops of footings.

3. Floor slabs keyed joints maximum spacing 20' plus or minus each direction unless otherwise noted.

A. Expansion Joints:

1. Locate as shown on drawings.

2. Joints in walkways maximum at 20' o.c., snap lines and saw-cut 1/8" wide by 1" deep between expansion joints in equal bays at not over 5' o.c., within 24 hours of concrete placement or until concrete is trafficable with power saw.

3. Joints shall be straight and smooth. They shall have hardened before fresh concrete is deposited against them.

4. Do not place expansion joints where slabs are up against the exterior of masonry walls, unless otherwise detailed on plans. Do not place any expansion material on the inside face of masonry walls where slabs are poured against same walls.

5. After concreting has been started, it should be carried on as a continuous operation until placing of a panel or section, as determined by its boundaries or joints, is completed.

3.04 CURING

A. Begin curing of concrete as soon as practicable after placing, but not more than 3 hours thereafter. Provide a total wet cure time of 7 days minimum at 50 degrees F minimum temperature.

B. Curing of structural members shall begin immediately after removal of forms.

C. Apply curing compounds as specified above, clear for exposed slabs. Compound used on floors that are to receive tile or other additional finish shall be compatible with adhesives and finish materials. Apply first coat of curing compound as soon as possible after pouring.

3.05 FINISHES

A. Formed Surfaces:

1. Finishes - Defined:

a. Rough Form Finish: Reasonable true to line and place. Tie holes and defects shall be patched and fins exceeding 1/4" in height shall

be chipped off or rubbed off. Otherwise, surfaces may be left with the texture imparted by the forms.

b. Smooth Form Finish: The form facing material shall produce a smooth, hard, uniform texture on the concrete. It may be plywood, tempered concrete-form-grade hardboard, metal, or other material capable of producing the desired finish. The arrangement of the facing material shall be orderly and symmetrical, with the number of seams kept to the practical minimum. It shall be supported by studs or other backing capable of preventing excessive deflection. Material with raised grain, torn surfaces, worn edges, patches, dents, or other defects which will impair the texture of the concrete surface shall not be used. Tie holes and defects shall be patched. All fins shall be completely removed. It is the intention of this surface to produce an Architectural Surface suitable for public view as a completed surface to receive paint. Strict quality control of this surface shall be required. See ACI 301.

c. Smooth Rubbed Finish: To be applied to all smooth form finishes. (All

work will conform with ACI Standard 301-latest edition) to produce a smooth architectural effect.

2. Finishes - Unspecified Buildings: If the finish is unspecified, the following finishes shall be used as applicable.

a. Rough Form Finish: For all concrete surfaces not exposed to public view, including concrete to receive stucco.

b. Smooth Form Finish: For all concrete surfaces exposed to view.

c. Smooth Rubbed Finish: Concrete shall have a Smooth Rubbed Finish applied to produce an architectural effect.

3. Patching: Immediately after stripping forms patch all defective areas with mortar similar to the concrete mix except that coarse aggregate shall be omitted. Bulges, minor honeycomb and other minor defects, as designated by the Architect, shall be patched only where exposed to view. Clean, dampen, and fill tie holes with patching mortar. All patching shall follow procedures and conform to ACI 301.

a. Major defective areas, as judged by the Owner's representative including those resulting from leakage of forms, excessive honeycomb, large bulges and large offsets at form joints, shall be

chipped away down to sound concrete. The patching mortar shall be pressed in for a complete bond and finished to match adjacent areas, or where defective areas impair the strength of the member in question, as judged by the Owner's representative, the member shall be removed or united as determined by the Owner's representative.

b. Minor defective areas, as judged by the Owner's representative including honeycomb, air bubbles, holes resulting from removal of ties, and those resulting from leakage of forms shall be patched with grout without resorting to chipping. Minor bulges and offsets at form joints shall be finished as specified herein below.

B. Uniform Surfaces – Flatwork:

1. General: Grade and screed the surfaces to the exact elevation, or slope shown or required. Make proper allowances for setting beds for ceramic tile. After screeding tamp mixture thoroughly to drive the coarse aggregate down from the surfaces and apply the applicable finish specified hereinafter. Always slope exterior walks away from the building at 1/8" per foot. Uncovered walks slope at 1/8" per foot or crown. Covered walks between buildings always slope to drain to the exterior and away from the buildings. At cross intersections of the walks, and at exterior doors, warp the surfaces to drain water from the walls. Provide control joints as indicated on drawings. Follow the requirements and procedures of ACI 301.

2. Finishes - Definitions (See also ACI 301):

a. Scratched Finish: After concrete has been placed, struck off, consolidated and leveled to a Class B tolerance, surface shall be roughened with stiff brush, rates or metal lath roller, before final set.

b. Floated Finish: After concrete has been placed, struck off, consolidated and leveled, concrete shall not be worked further until water sheen has disappeared and/or when mix has stiffened sufficiently to permit proper operations of a power driven float. Consolidate with power driven float, check trueness of surface, fill low spots and cut down high spots to achieve Class B tolerance. Then, re-float to uniform, smooth, granular texture.

c. Troweled Finish: Finish same as above for floated finish and in addition, steel trowel the surface by hand to produce a smooth, glassy, impervious surface free of trowel marks to a Class A tolerance. On surfaces intended to support floor coverings, defects of sufficient magnitude to show through the floor covering shall be removed by grinding.

d. Broom Finish: Finish same as above for floated finish to a Class B tolerance and then draw a broom or burlap belt across surface transversely.

Finishes - Unspecified

1. When type of finish is not specified, the following shall be applicable:
   a. Scratched Finish: For surfaces to receive bonded cementitious application, i.e. ceramic tile, single ply epoxy flooring etc., refer to drawings for locations of specific floor coverings.

   b. Troweled Finish: For surfaces intended as smooth walking surfaces or for receipt of floor coverings.

   c. Broom Finish: For exterior walks, loggias, curbs and where indicated on drawings.

   d. Float Finish: Exterior platforms, steps, stairways, landings, and ramps.

Specific Finish Locations:

1. Slab areas to receive ceramic tile, resilient floor coverings, specialized gymnasium flooring, or slabs within a minimum of 2 feet each side of accordion doors shall be "dead level" - Class A. All other slab areas - Class B.

Tolerances for finishes as specified shall be as follows:

1. Class A - True planes within 1/8" in 10 ft.

2. Class B - True planes within 1/4" in 10 ft.

NOTE: Tolerances shall be measured by placing a 10-ft. straightedge anywhere in any direction.

*****END OF SECTION*****

SECTION 04230 - REINFORCED UNIT MASONRY

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. Extent of each type of masonry work is indicated on drawings and schedule.

1.03 QUALITY ASSURANCE

A. ASTM Standards (Latest Edition)

ASTM C90	Hollow Load Bearing Concrete Block
ASTM C270	Type-M mortar
ASTM C150-98	Type I Portland cement
ASTM C207-97	Hydrated Lime

B. Construction Tolerances:

1. Variation from Plumb:
   For vertical lines and surfaces of columns, do not exceed ¼".

2. Variation in Cross-Sectional Dimensions:
   For columns and thickness of walls, from dimensions shown, do not exceed minus ¼" nor plus ½".

1.04 SUBMITTALS

A. Product Data: Submit manufacturer's specifications and other data for each type of masonry unit, accessory, and other manufactured products, including certifications that each type complies with specified requirements. Include instructions for handling, storage, installations and protection.

1.05 JOB CONDITIONS

A. Protection of Work: During erection, cover top of walls with heavy waterproof sheeting at end of each day's work to protect completed work that has not had enough time for the mortar to cure and is still subject to rain damage.

B. Extend cover a minimum of 24 inches down both sides and hold cover securely in place.

C. Staining: Prevent grout or mortar from staining the face of masonry to be left exposed or painted. Remove immediately grout or mortar in contact with such masonry.

D. Protect sill, ledges, finished door and window frames and projections from droppings of mortar.

PART 2 - PRODUCTS

2.01. MATERIALS

Hollow Load Bearing Concrete Block:	ASTM C90- Grade N, Type II, cured 28 days
Mortar:	Type "M", ASTM C270
Cement:	ASTM C150-98, Type I
Hydrated Lime:	ASTM C 207-97
Sand:	Clean Masons Sand
Water:	Potable

2.02 CONCRETE BLOCK

A. Provide units complying with characteristics indicated below for Grade, Type, face size, exposed face and, under each form of block included, for weight classification.

1. Grade N, Type II C.M.U., normal weight unit, fm' 1500 psi.

2. 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. Splits and halves as appropriate for coursing in vertical and horizontal directions.

3. Hollow Load-Bearing Block: ASTM C-90 and as follows:
   a. Weight Classification: Normal weight.
   b. Refer to the Architectural Drawings for specific block types when fire rated walls occur.
   c. Refer to the Architectural Drawings for specific block types for finished block to receive paint or standard stucco block to receive stucco.

2.03 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. Hydrated Lime: ASTM C-297, Type S.

C. Aggregate for Mortar: ASTM C-144, except for joints less than 1/4" use aggregate graded with 100% passing the No. 16 sieve.

D. Aggregate for Grout: ASTM C-404.

E. Mortar: ASTM C270, Type-M, 2,500 p.s.i.

F. Joint Reinforcement: ASTM A951, 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 reinforcement 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 ½' elsewhere.

2. Wire Size for Side Rods: 9 gauge galvanized.

3. Wire Size for Cross Rods: 9 gauge galvanized.

4. For single-wythe masonry provide type as follows with single pair of side rods:

a. Truss design, as manufactured by Dur-o-wall, (or approved equal), with diagonal cross rods spaced not more than 16" o.c. Units to be 9 gauge hot dipped galvanized.

2.04 MISCELLANEOUS MASONRY ACCESSORIES

A. Reinforcing Bars:
Deformed steel, ATSM A-615, Grade 60 for bars No. 3 to No. 18.

B. Non-Metallic Expansion Joint Strips:
Material as indicated below, designed to fit standard sash block and to maintain lateral stability in masonry walls: size and configuration as indicated.

1. Styrene-butadiene rubber compound complying with ASTM D 2000, Designation 2AA-805.

C. Bond Breaker Strips:
Asphalt-saturated organic roofing felt complying with ASTM D-226, Type I (No. 15 asphalt felt).

D. Metal cavity caps in lieu of waste mortar shipping bags.

2.05 MORTAR AND GROUT MIXES

A. General:
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.

B. 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.

C. Mortar for unit Masonry:
Comply with ASTM C780, proportion Specification, for types of mortar required, unless otherwise indicated.

D. Grout for Unit Masonry:
Comply with ASTM C476, 2,500 p.s.i., for grout for use in construction of reinforced and non-reinforced unit masonry. Use grout of consistency indicated or if not otherwise indicated, of consistency (fine or coarse) at time of placement which will comply completely fill all spaces intended to receive grout.

1. Use fine grout in grout spaces less than 2" in horizontal direction, unless otherwise indicated.

2. Use coarse grout in grout spaces 2" or more in least horizontal dimension, unless otherwise indicated.

E. Masonry Compressive Strength: *fm'* 1,500 p.s.i. (Minimum).

PART 3 - EXECUTION

3.01. INSTALLATION, GENERAL

A. See Structural and Architectural Drawings for notes and details and masonry opening requirements. Coordinate all door and window masonry openings with the scheduled manufacturers per the plans. Tolerances are critical to meet the wind load performance testing for said openings within the 130 and 140 mph wind speed zones.

B. Set blocks with 3/8" full, flush joints in running bond. Use a masonry interlock (50% masonry bond) at all intersecting walls where possible. All work not plumb, true and accurate shall be replaced.

C. Store all materials off the ground and protect from all dirt and foreign material.

D. Do not retemper any mortar. Discard the mortar if it has begun to set.

E. Provide Dur-O-Wall, (or approved equal), truss-type, horizontal reinforcing at every other block course. At door and window openings, provide continuous Dur-O-Wall horizontal reinforcing at the first and second block courses above and below the opening or extend the reinforcing back a minimum of two (2) feet from the opening. Extend Dur-O-Wall reinforcing 1-1/2" into concrete columns. Lap splices shall not be less than 6". Cut or interrupt joint reinforcement at control and expansion joints, unless otherwise indicated.

F. All cells designated on the drawings to be filled with concrete are to be kept clean of any and all debris. Provide inspection/clean-out holes at the bottom course. Inspection holes in finish block shall be neatly saw-cut.

G. All lintels shall have minimum bearing as called out on the Structural Drawings.

H. Do not wet concrete masonry units during installation.

I. Cleaning Reinforcing: Before placing, remove loose rust, and other coatings from reinforcing.

J. Thickness: Build walls to the actual thickness of the masonry units, using units of nominal thickness indicated.

K. Build chases and recesses as shown and required for the work of other trades. Provide not less than 8" of masonry between chase or recess and jamb of openings, and between adjacent chases and recesses. See plans for specific conditions.

L. Leave openings for specialty equipment to be installed before completion of masonry work. After installation of equipment, complete masonry work to match work immediately adjacent to the opening.

M. 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.

N. Use inspection and clean-out holes at bottom of wall reinforced vertical cells, for grouting lifts over 5 feet high. C

O. lean-out holes should be 4"w X 8" h minimum. See ACI 530-92, Section 4.3.2.3.

3.02 CONSTRUCTION TOLERANCES

A. Variation from Plumb:
For vertical lines and surfaces of columns, walls and arises do not exceed ¼" in 10' or 3/8" in a story height not to exceed 20', nor ½" in 40' or more. For external corners, expansion joints, control joints, and other conspicuous lines, do not exceed 1/4" in any story of 20' maximum, nor ½" in 40' or more. For vertical alignment of head joints do not exceed plus or minus ¼" in 10', ½" maximum.

B. Variation from Level:
For bed joints and lines of exposed lintels, sills, parapets, horizontal grooves and other conspicuous lines, do not exceed ¼" in any bay or 20' maximum, nor ½" in 40' or more. For top surface of bearing walls no 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 ½" 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 ½".

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 ½". 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. Stopping and Resuming Work:
Rack back ½-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.

D. 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. Do not fill space between hollow metal frames and masonry with mortar, unless otherwise indicated. 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.

2. Fill cores in hollow concrete masonry units with grout 3 courses (24") 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.

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.

F. Collar Joints:
After each course is laid, fill the vertical longitudinal joint between wythes solidly and with mortar for all exterior walls.

G. Corners:
Provide interlocking masonry unit bond in each course at corners, unless otherwise shown.

1. For horizontally reinforces masonry, provide continuity at corners with prefabricated "L" units, in addition to masonry bonding.

H. Intersecting and Abutting Walls:
If carried up separately, block or tooth vertical joint with 8" maximum offsets and provide rigid steel anchors spaced not more than 4'-0" o.c., vertically, or omit blocking and provide rigid steel anchors at not more than 2'-0" o.c. vertically.

Form anchors of galvanized steel not less than 1-1/2" x 1/4" x 2'-0" long with ends turned up not less than 2" or with cross-pins. If used with hollow masonry units, embed ends in mortar-filled cores.

I. Non-bearing Interior Partitions:
Build full height of story to underside of solid floor or roof structure above, unless otherwise shown.

1. Wedge non-bearing partitions against structure above with small pieces of tile, slate or metal. Fill joint with mortar after dead load deflection of structure above approaches final position.

3.05 LINTELS

A. Provide precast or formed-in-place masonry lintels. Cure precast lintels before handling and installation. Temporarily support formed-in-place lintels.

B. For hollow concrete masonry unit walls, use specially formed U-shaped lintel units with reinforcement bars placed as shown filled with coarse grout.

C. Provide minimum bearing of 8" at each jamb, unless otherwise indicated.

3.06 FIELD QUALITY CONTROL

A. When field observation by the Architect or the Owner's Agent which generates questions relating to tolerance or quality control, the 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 per tolerances stipulated within this section.

B. Unit Test Method: For each block type specified per ASTM C90.

C. 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:
If required by Architect, test masonry prisms by methods of sampling and testing of ASTM E-447, Method B.

2. 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. Protection:
   Provide final protection and maintain conditions in an acceptable manner to ensure that the final unit masonry work is without damage and deterioration at time of substantial completion.

*****END OF SECTION*****

SECTION 05400 - LIGHT GAGE METAL FRAMING

PART 1 - GENERAL

1.01 RELATED DOCUMENTS IN OTHER SECTIONS

Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division-1 Specification sections, apply to work specified in this section.

1.02 DESCRIPTION OF WORK

Extent of lightgage metal framing (LtGMFrm) is shown on drawings.
Types of lightgage metal framing units include the following: "C" shaped steel studs.

1.03 QUALITY ASSURANCE

A. Components Design: Compute structural properties of studs and joists in accordance with AICS "Specification for design of Cold-Formed Steel Structural Members".

B. Fire-Rated Assemblies: Where framing units are components of assemblies indicated for a fire-resistance rating, including those required for compliance with governing regulations, provide units which have been approved by governing authorities having jurisdiction.

C. Manufacturers offering products complying with requirements for lightgage metal framing components include the following:

Shaped load bearing studs, 1-5/8" flange:
Alabama Metal Industries
Marino Ware
Dietrick
Roll Form Products, Inc.
U.S. Steel Corp.
Wheeling Corrugating Co.

1.04 SUBMITTALS

A. Products data: Submit manufacturer's product information and installation instructions for each items of lightgage framing and accessories.

B. Shop Drawing: Submit shop drawings for special components and installations not fully dimensioned or detailed in manufacturer's product data. Signed and sealed Shop Drawings required by a Florida Registered Structural Engineer. Include placing drawings for framing members showing size and gage designations, number, type, locations and spacing. Indicate supplemental strapping, bracing, splices, accessories, and details required for proper installation.

1.05 DELIVERY AND STORAGE

A. Protect metal framing units from rusting and damage. Deliver to protect site in manufacturer's unopened containers or bundles, fully identified with name, brand, type and grade. Store off ground in a dry ventilated space or protect with suitable waterproof coverings.

PART 2 - PRODUCTS

2.01 METAL FRAMING

A. System Components: With each type of metal framing required, provide manufacturer's standard steel runners, tracks, blocking, lintels, clip angles, shoes, reinforcements, fasteners and accessories recommended by manufacturer for applications indicated as needed to provide a complete metal framing system.

B. Materials and Finishes
For 16 gage and heavier units, fabricate metal framing components of structural quality steel sheet with a minimum yield point of 40,000 psi; ASTM A 446, A 570, or A 611.
For 18 gage and lighter units, fabricate metal framing components of commercial quality steel sheet with a minimum yield point of 33,000 psi; ASTM A 466, A 570, Or A 611. Provide galvanized finish to metal framing components complying with ASTM A 525 for minimum G 60 coating at exterior wall panel studs. Provide prime coated finish with one coat of shop-applied red oxide, zinc-chromate, or other similar rust-inhibitive primer for interior studs. "C"-Shape Studs: Manufacturer's standard load-bearing steel studs of size shape, and as located on the drawings with 1-5/8" (1.625") flange and flange return to lip.
GAGES AS DETERMINED BY THE FOLLOWING CHART:
(Interior Framing: Limiting Heights - ST Style Studs. Stud gages apply for single and double layers of gypsum application on walls using L/360 allowable deflection) with no midspan wall blocking, cats, lateral bracing, or cold rolled channel bracing run through stud perforations. Allowable heights can be exceeded by 20% when continuous wall bracing or blocking is provided.

STUD WIDTH GA	STUD SPACING	MAX. HGT. 25 GA	MAX. HGT. 22 GA	MAX. HGT. 20
3-5/8"	16" o/c	10'-0"	12'-0"	14'-0"
3-5/8"	24" o/c	8'-0"	10'-0"	12'-0"
6"	16" o/c	15'-0"	17'-0"	19'-0"
6"	24" o/c	13'-0"	15'-0"	17'-0"

2.02 FABRICATION

A. General: Framing components may be prefabricated into panels prior to erection. Fabricate panels plumb, square, true to line and braced against racking with joints welded. Perform lifting of prefabricated panels in a manner to prevent damage or

distortion. Stud panels to be rechecked for plumbness after installation.

B. Fastenings: Attach similar components by welding. Attach dissimilar components by welding, bolting, or screw fasteners, as standard with manufacturer.

PART 3 - EXECUTION

3.01 INSPECTION AND PREPARATION

Pre-Installation Conference: Prior to star of installation of metal framing systems, meet at project site with installers of other work including metal panels, door and window frames and mechanical and electrical work. Review areas of potential interference and conflict, and coordinate layout and support provisions for interfacing work.

3.02 INSTALLATION

A. Manufacturer's Instructions: Install metal framing systems in accordance with manufacturer's printed or written instructions and recommendation, and Engineered Shop Drawings, unless otherwise indicated.

B. Runner Tracks: Install continuous tracks sized to match studs. Align tracks accurately to layout at base and tops of studs. Secure tracks as recommended by stud manufacturer for type of construction involved, except do not exceed 24" o.c. spacing for nail or power-driven fasteners, nor 16" o.c. for other types of attachment. Spacing of studs at metal wall panels to be as per panel manufacturers request. Provide fasteners at corners and ends of tracks.

C. Set studs plumb, except as needed for diagonal bracing or required for non-plumb walls or warped surfaces and similar requirements.

D. Where stud system abuts structural columns or walls, including masonry walls, anchor ends of stiffeners to supporting structure.

E. Install supplementary framing, wood blocking and bracing at metal framing system wherever walls or partitions are indicated to support fixtures, equipment, services, casework, heavy trim and furnishing, wall mounted door stops, bathroom grab bars and similar work requiring attachment to the wall or partition. Where type of supplementary support is not otherwise indicated, comply with stud manufacturer's recommendations and industry standards in each case, considering weight or loading resulting from item supported.

F. Installation of Wall Stud System: Secure studs to top and bottom runner tracks by either welding or screw fastening at both inside and outside flanges.

G. Frame wall openings larger than 2'-0' square with double stud at each jamb of frame except where more than 2 are either shown or indicated in manufacturer's instructions. Install runner tracks and jack studs above and below wall openings.

Anchor tracks to jamb studs with stud shoes or by welding, and space jack studs same as full height studs of wall. Secure stud system wall opening frame in manner indicated.

*****END OF SECTION*****

SECTION 06100 - ROUGH CARPENTRY

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

Documents 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. Definition: Rough carpentry includes carpentry work not specified as part of other sections and which is generally not exposed, except as otherwise indicated. Types of work in this section include, but are not limited to, rough carpentry for:

1. Nailers & dead wood
2. Cant strip
3. Wood roof curb supports
4. Door frame bracing
5. Chalk, tack board, backing
6. Casework backing
7. Plumbing backing - (Supports)
8. Projection screen backing
9. Window stripping
10. Recessed clock/speakers (framed opening)
11. Recessed fire extinguisher cabinets (framed opening) RWL - Access to clean out.
12. Toilet partition backing
13. Recessed electrical panels backing
14. Mirror backing
15. Acoustical backing
16. Ceiling trim backing

B. Finish carpentry is specified in another section within Division 6.

1.03 SUBMITTALS

A. Wood treatment Data: Submit treatment manufacturer's instructions for proper use of each type of treated material.

B. Pressure Treatment: For each type of specified, include certification by treating plant stating chemicals and process used, net amount of preservative retained and conformance with applicable standards.

C. For water-borne preservatives, include statement, that moisture content of treated materials was reduced to a maximum of 15% prior to shipment to project site.

D. Fire-retardant treatment: Include certification by treatment plant that treatment material complies with governing ordinances and that treatment will not bleed through finished surfaces.

1.04 PRODUCT HANDLING

Delivery and Storage: Keep materials dry at all times. Protect against exposure to weather and contact with damp or wet surfaces. Stack lumber and plywood, and provide air circulation within stacks.

1.05 JOB CONDITIONS

Coordination: Fit carpentry work to other work; scribe and cope as required for an accurate fit. Correlate location of furring, nailers, blocking, grounds and similar supports to allow proper attachment of other work.

PART 2 - PRODUCTS

2.01 WOOD PRODUCT QUALITY STANDARDS

A. Lumber Standards: Comply with PS 20.

B. Plywood Standards: Comply with PS 1.

C. Factory mark each piece of lumber and plywood with type, grade, mill and grading agency, except omit marking from surfaces to be exposed with transparent finish or without finish.

2.02 MATERIALS

A. Nominal sizes are indicated, except as shown by detail dimensions. Provided actual sizes as required by PS 20, for moisture content specified for each use. Provide dressed lumber, S4S, unless otherwise indicated. Provide seasoned lumber with 10% maximum moisture content at time of dressing.

B. Framing Lumber: (2" through 4" thick)

C. For light framing (less than 6" wide), provide the following grade and species:

Construction grades, any species.

D. Miscellaneous Lumber: Provide wood for support or attachment of other work including cant strips, bucks, nailers, blocking, furring, grounds, stripping, and similar members. Provide lumber of sizes shown or specified, worked into shapes shown, and as follows.

Moisture content: 19% maximum for lumber items not specified to receive wood preservative treatment.

E. Grade: Construction Grade light framing size lumber of any species or board size lumber as required. Provide construction grade boards (RIS or WCLB) or No. 2 boards (SPIB or WWPA).

F. Plywood: Where plywood will be exposed in finished work supply the following:

1. Where painted finish is indicated, provide A-C/EXT-APA plywood with Grade A face exposed and Grade C concealed, for exterior use; and provide A-D/INT-APA plywood with Grade A face exposed and Grade D concealed, for interior use.

2. Concealed Plywood: Where plywood will be concealed by other work, provide C-D Plugged/INT-APA.

3. For backing panels for electrical or telephone equipment, provide 3/4" fire-retardant treated plywood with exterior glue.

2.03 MISCELLANEOUS MATERIALS

A. Fasteners and Anchorages: Provide size, type, material and finish as indicated and as recommended by applicable standards, complying with applicable Federal Specifications' for nails, staples, screws, bolts, nuts, washers and anchoring devices. Provide metal hangers and framing anchors of the size and type recommended by the manufacturer for each use including recommended nails.

Where rough carpentry work is exposed to weather, in ground contact, or in area of high relative humidity, provide **stainless steel fasteners type 305 or 316.**

Interior work shall utilize hot dipped galvanized.

B. Building Paper Interior Use Only: Asphalt saturated felt, non-perforated, 15# or 30 #, ASTM D226.

2.04 WOOD TREATMENT

A. Preservative treatment: Where lumber or plywood is indicated as "Trt-Wd", "P.T." or "Treated", or is specified herein to be treated, comply with applicable requirements of AWPA Standards C2 (Lumber) and C9 (Plywood) and of AWPA standards listed below. Mark each treated items with the AWPB Quality Mark Requirements.

B. Pressure-treat above-ground items with water-borne preservatives complying with AWPB LP-2. After treatment, kiln-dry to a maximum moisture content of 15. Treat indicated items and the following:

Wood cants, nailers, cures, blocking, stripping, and similar members in connection with roofing, flashing, vapor barriers and water proofing. Wood sills, sleepers, blocking furring, stripping and similar concealed members in contact with masonry or concrete.

C. Fire-Retardant Treatment: Where "FR-S" lumber or plywood is specified or otherwise indicated, provide materials which comply with AWPA standards for pressure impregnations with fire-retardant chemicals, and which have a flame spread rating of not more than 25 when tested in accordance with UL Test 723 or ASTM E84, and show no increase in flame spread and significant progressive combustion upon continuation of test for an additional 20 minutes.

Kiln-dry treated items to maximum moisture content of 19%.

Provide UL label on each piece of fire-retardant lumber or plywood.

D. Inspect each piece of treated lumber or plywood after drying and discard damaged or defective pieces.

PART 3 - EXECUTION - INSTALLATION

3.01 GENERAL

A. Discard units of material with defects which might impair quality of work, and units which are too small to fabricate work with minimum joints or optimum joint arrangement.

B. Set carpentry work accurately to required levels and lines, with members plumb and true and accurately cut and fitted.

C. Securely attach carpentry work to substrate by anchoring and fastening as shown and as required by recognized standards. Countersink nail head on exposed carpentry work and fill holes.

D. Use common wire nails, except as otherwise indicated. Use finishing nails for finish work. Select fasteners of size that will not penetrate members where opposite side will be exposed to view or will receive finish materials. Make tight connections between members. Install fasteners without splitting of wood; pre-drill as required.

3.02 WOOD GROUNDS, NAILERS, BLOCKING, AND SLEEPERS

A. Provide wherever shown and where required for screeding or attachment of other work. Form to shapes as shown and cut as required for true line and level of work to be attached. Coordinate location with other work involved.

B. Attach to substrates as required to support applied loading. Countersink bolts and nuts flush with surfaces, unless otherwise shown. Build into masonry during installation of masonry work. Where possible, anchor to formwork before concrete placement.

C. Provide permanent grounds of dressed, preservative treated, key-beveled lumber not less than 1 ½" wide and thickness required to bring face of ground to exact thickness of finish material involved. Remove temporary grounds when no longer required.

3.03 WOOD FURRING

A. Install plumb and level with closure strips at edges of openings. Shim with wood as required for tolerance of finished work.

B. Furring to Receive Plywood Paneling: Unless otherwise shown, provide 1"x 3" furring at 2 'o.c., horizontally and vertically. Structural framing to receive furring will dictate the spacing, size and type of furring. Refer to drawings and details.

3.04 WOOD FRAMING, GENERAL (WD-FRM)

A. Provide framing members of sizes and on spacings shown, and frame openings as shown, or if not show, comply with recommendations of "Manual for House Framing" of National Forest Productions Association. Do not splice structural members between supports.

B. Anchor and nail as shown, and to comply with "Recommended Nailing Schedule" of "Manual for Housing Framing" and other recommendations of the N.F.P.A.

3.05 INSTALLATION OF PLYWOOD (PWD)

A. Comply with recommendations of the American Plywood Association (APA), for the installation of plywood and per the current edition of the Florida Building Code nailing patterns.

3.06 GENERAL REQUIREMENTS

1. All work shall comply with the standards of the American Institute of Timber Construction, AWI, API, AWPA, and local codes and regulations.

2. All framing shall be square, plumb and true.

3. All furring shall be shimmed to a plumb, true surface.

4. All lumber in contact with masonry shall be #2 yellow pine, pressure treated.

5. Coordinate blocking and backing requirements of all trades and provide where indicated and required.

6. Provide solid blocking behind all shower valves.

7. Provide rough openings for all manufactured items such as medicine cabinets, fire extinguisher cabinets, etc.

8. Provide wood fire cats in all **interior and exterior** wood framed walls where vertical cavity exceeds 8 feet and where soffits adjoin vertical walls.

9. Construct 3/4 inch BC plywood plenum bases, including vertical sides, for all Closet Mounted Air-Handling Units. Line interiors with 5/8" type "X" gypsum board and rigid foil faced insulation board to comply with non-combustible plenum requirements.

*****END OF SECTION*****

SECTION 06192 -FABRICATED WOOD TRUSSES

PART 1 - GENERAL

1.01 Work Included

A. Fabricate, supply and erect wood trusses as shown on the drawings and as specified. Work to include anchorage, blocking, curbing, miscellaneous framing and bracing.

1.02 Definitions

A. TRUSS: The terms "truss" and "wood truss component" refer to open web load carrying assemblies suitable for support of roof decks or floors in buildings.
B. MANUFACTURER: A manufacturer who is regularly engaged in design and fabrication of wood truss components.
C. TRUSS INSTALLER: Builder, general contractor, contractor or sub-contractor who is responsible for the field storage, handling and installation of trusses.

1.03 Design

A. Trusses shall be designed in accordance with these specifications and where any applicable design feature is not specified herein, design shall be in accordance with applicable provisions of latest edition of National Design Specifications for Wood Construction (NDS) American Forest and Paper Association (AFPA), and Design Specifications for Metal Plate Connected Wood Trusses (ANSI/TPI 1) Truss Plate Institute (TPI), and code of local jurisdiction.

B. Manufacturer shall furnish design drawings bearing seal and registration number of a civil or structural engineer licensed in the state where trusses are to be manufactured and installed. The truss fabrication/shop drawings shall be reviewed by the Architect prior to fabrication.

C. Truss design drawings shall include as minimum information:
   1. Span, depth or slope and spacing of trusses;
   2. Required bearing width within 1/8 of an inch;
   3. Design loads as applicable:
      a) Top chord live load;
      b) Top chord dead load;
      c) Bottom chord live load;
      d) Bottom chord dead load;
      e) Concentrated loads and their points of application; and
      f) Wind uplift reactions at a typical truss and all girders.
   4. Adjustment to lumber and plate design loads for condition of use;
   5. Reactive forces, their points of occurrence and direction;
   6. Truss Plate Manufacturer's plate type, gage, size and location of plate at each joint;

7. Lumber size, species and grade for each member;
8. Location of any required continuous later bracing, i.e. T-backs, lateral or diagonal bracing;
9. Calculated deflection ratio and/or maximum deflection for live and total load;
10. Maximum axial compression forces in truss members;
11. Location of joints. NOTE: provide splice blocks at all bottom chord splices that do not occur at panel points;
12. Connection requirements for:
    a) Truss to truss girders;
    b) Truss ply to ply; and
    c) Field splices.

PART 2 - PRODUCTS

2.01 Materials

A. Lumber:

1. Lumber used for truss members shall be in accordance with published Values of Lumber rules writing agencies approved by board of review of American Lumber Standards Committee. Lumber shall be identified by Grade mark of a lumber inspection bureau or agency approved by that Board, and shall be as shown on design drawings.
2. Moisture content of lumber shall be no less than 7 percent nor greater than 19 percent at time of fabrication.
3. Adjustment of values for duration of load or conditions of use shall be in accordance with National Design Specifications for Wood Construction (NDS).
4. Fire retardant treated lumber, if applicable, shall meet specifications of truss design and ANSI/TPI 1-1995, par 9.1.5 and shall be redried after treatment in accordance with AWPA Standard C20. Allowable values must be adjusted in accordance with NDS par 2.3.6. Lumber treater shall supply certificate of compliance.

B. Metal Connector Plates:

1. Metal connector plates shall be manufactured by MITEK or ALPINE/ LUMBERMATE/CLARY and shall be not less than .036 inches in thickness (20 gage) and shall meet or exceed ASTM A653-94 grade 37, and shall be hot dipped galvanized according to ASTM A653-94, coating designation G60. Working stresses in steel are to be applied to effective ratios for plates as determined by test in accordance with Appendix E and F of ANSI/TPI 1-1995.

2. In highly corrosive environments, special applied coatings or stainless may be required. See plans for specific description of plates.

3. The truss manufacturer shall furnish a certified record that materials comply with

steel specifications.

2.02 Fabrication

1. Trusses shall be fabricated in a properly equipped manufacturing facility of a permanent nature. Trusses shall be manufactured by experienced workmen, using precision cutting, jigging and pressing equipment meeting requirements of ANSI/TPI 1-1995, Section 4. Truss members shall be accurately cut to length angle and true to line to assure proper fitting joints within tolerances set forth in ANSI/TPI 1-1995, Section 4, and proper fit with other work.

PART 3 - EXECUTION

3.01 Handling, Installation and Bracing

A. Trusses shall be handled during fabrication, delivery and at jobsite so as not to be subjected to excessive bending.
B. Trusses shall be unloaded on smooth ground to avoid lateral strain. Trusses shall be protected from damage that might result from on-site activities or environmental conditions. Prevent toppling when banding is removed.
C. Handle during installation in accordance with Handling, Installing and Bracing Wood Trusses (HIB-91), TPI, and ANSI/TPI 1-1995. Installation shall be consistent with good workmanship and good building practices and shall be the responsibility of the Truss Installer.
D. Apparent damage to trusses, if any, shall be reported to Manufacturer prior to installation.
E. Trusses shall be set and secured level and plumb, and in correct location. Trusses shall be held in correct alignment until specified permanent bracing/strapping is installed.
F. Cutting and altering of trusses is not permitted.
G. Concentrated loads shall not be placed atop trusses until all specified bracing has been installed and decking is permanently nailed in place. Specifically avoid stacking full bundles of decking or other heavy materials onto unsheathed trusses.
H. Erection bracing is always required. Professional advice should always be sought to prevent toppling or dominoing of trusses during installation. Safety is the sole responsibility of the Truss Installer.
I. The Contractor is responsible for obtaining and furnishing the materials used for installation and permanent bracing.

*****END OF SECTION*****

SECTION 07190 - VAPOR BARRIER

PART 1 - GENERAL

1.01 RELATED WORK FOUND IN OTHER SECTIONS

Soil conditions under vapor barrier - Section 02010
Concrete - Section 03010

PART 2 - PRODUCTS

2.01 VAPOR BARRIER:

A. 6 Mil Polyethylene film under concrete slabs.
B. Anti-tear visqueen on lower face of joists on elevated manufactured buildings.
C. Tape: As recommended by manufacturer of vapor barrier.
D. Staples: Monel or stainless when exposed to weather.

PART 3 - EXECUTION

3.01 INSTALLATION:

A. Apply vapor barrier over entire area to receive slab; lap edges 12 inches and seal with tape. Turn edges up to top of slab or down to bottom of footings. Where expansion joints are indicated at adjacent vertical surfaces, extend vapor barrier beyond expansion joint filler and turn up to top of slab. Where expansion joints are indicated within the slab, lay vapor barrier continuous under expansion joint filler.

B. Apply anti-tear visqueen to underside of joists of manufactured buildings with monel or stainless steel staples at 6 inches on center perpendicular to tension of visqueen. Lap all edges a minimum of 6 inches. Seal around all mechanical, electrical, or similar penetrations to prevent moisture and rodent infiltration. Provide solid backing adjacent to and around said penetrations to receive moisture barrier.

3.02 PROTECTION:

A. Protect vapor barrier from damage. Repair punctures and tears using patches of the material which overlaps a minimum of 12 inches. Seal with tape or secure with staples.

*****END OF SECTION*****

SECTION 07200 - INSULATION

PART 1 - ROOF/CEILING ASSEMBLIES:

1.01.1 When Wood Trusses in combination with Vented Soffits:

When called out and detailed on the wall sections- Provide (R-19, R-28 or R-30) fiberglass or rockwool Batt Insulation installed between the bottom chords of the pre-engineered roof trusses. Install in all ceiling spaces as shown on the drawings and building sections. Provide the clear air space above insulation at tails of trusses as required by the Florida Model Energy Code.

1.02 When Wood Trusses in combination with Non-Vented Soffits:

When called out and detailed on the wall sections- Provide sprayed insulation to the underside of the plywood decking as manufactured by **Icynene, or an approved equal with a similar perm rating,** to a minimum R-Rating of 20.0. Refer to Section 07205 Icynene Insulation for manufacturer's data and the plans for actual placement.

1.03 When nominal Wood Rafters, Heavy Timber framing or Engineered Glu-Lam framing with exposed tongue and groove wood decking or exterior plywood:

When called out and detailed on the wall sections- Provide rigid foam insulation board above the wood deck with high performance dry-in and roofing membranes per manufacturer's requirements.

1.04 When Steel Joists: (Three methods- When called out and detailed on the wall sections)

A. Provide R-19 nailable rigid roofing deck secured to pan-deck as per drawings.

B. Provide (R-19) Batt insulation - suspended by clips and nylon mesh between the joists bottom chord when no insulation is provided on the metal roof decking. Refer to drawings for placement. Do not lay insulation on top of suspended acoustic ceiling panels.

C. Provide (R-19 overall average) EPS roof deck insulation integral with the lightweight concrete or cellcore deck pour. Refer to drawings for placement, thicknesses and slopes.

1.04 When Concrete Joists and Deck:

Provide roof top insulation board per plans for uppermost floor. No ceiling insulation for all lower floor/ceiling assemblies.

1.05 When Ceiling Assembly is used as a return air plenum:

Insulation within the plenum space must meet flame spread and smoke development ratings of the current FBC and Life Safety Codes for an exposed installation.

PART 1 - EXTERIOR WALLS:

2.01 When Concrete Block Walls:

(Two Methods: Refer to plan section and details for final system)

A. Provide furring on the interior face of the block walls as per plans and place rigid insulation of thickness called out on the wall sections.

B. Fill the exterior block cells with **CoreFill 500** amino-plast, Class-A, Foam insulation, (or an approved equal product). The thermal properties for an 8" block/60 lbs. Density wall assembly is R-14.2. Install in strict compliance with manufacturers application procedures. **Thermco Foam Insulation** and **CoreFoam, Inc.** are approved equal products.

2.02 When Wood Frame or Steel Assembly Walls:

R-11 in 3 ½" walls, and R-19 in 5 ½" walls. Utilize foil faced or waxed Kraft paper faced fiberglass batt insulation. V.B. to weather side.

2.03 When Insulated Concrete Tilt-wall Sandwich Panels:

Provide extruded Dow STYROFOAM Brand rigid blue board insulation with heat formed, regular spaced holes identifying connector plate locations. Thicknesses per the plan with a minimum of 1 ½ inch thickness in all applications.

PART 3 - INTERIOR WALLS:

3.01 Framed Walls, Wood or Metal Stud:

3-1/2" Sound Batt insulation where shown on the plans.
Staples or Adhesive: As recommended by the insulation manufacturer.

PART 4 - ATTIC BARRIERS:

4.01 When called out on the plans, provide a roll foil perforated vapor barrier as manufactured by **Fi-Foil.** Location, type, and application method as called out on the sections and details. Staples, pins and tape as recommended by the insulation manufacturer.

PART 5 - SUSTAINABLE (GREEN) PROJECT REQUIREMENTS

5.01 For all projects seeking a sustainable green certification, such as USGBC LEED or an equivalent rating system, utilize only ecologically recognized products such as:

A. Knauf Ecobatt (or equal) to replace standard fiberglass batt insulation products.
B. Thermafiber SAFB (or equal) mineral wool with special 90% green fiber recycled content.
C. Homasote 440 SoundBarrier w/ 98% Post-Consumer by weight recycled product.
D. BioBased 501w or 502 spray foam insulation at underside of roof decks.

PART 6 - INSULATION PRODUCTS MANUFACTURERS

6.01 For the insulation products specified on the plans utilize one of the following approved manufacturers:

Johns Manville
Owens Corning
Celotex
Knauf Ecobatt
Thermafiber
Homasote
BioBased
Icynene
Dow

PART 7 - INSTALLATION:

7.01 Allow proper air space for thermal insulation, using flanges provided, in accordance with manufacturer's printed instructions.

7.02 When utilizing a vented soffit assembly, provide a minimum of a 2" air space at all perimeter overhangs between the insulation face and the underside of roof decking. Utilize vinyl or cardboard prefab vent sleeves as required to maintain said clearance.

7.03 Concealed Installation: in buildings **of any type construction,** shall have a flame spread rating of not more than 75 and a smoke development rating of not more than 450.

7.04 Exposed Installation: in buildings **of any type construction,** shall have a flame spread rating of not more than 25 and a smoke development rating of not more than 450.

7.05 Vapor Retarders: in order to prevent indoor air quality problems in hot, humid climates, vapor retarders such as asphalt impregnated felts, polyethelenes, or "Tyvics", should be placed on the outside, or weather side, of the insulation as a complete building wrap.

*****END OF SECTION*****

SECTION 07205 - ICYNENE INSULATION SYSTEM

1.01 PRODUCT NAME

A. Icynene® and The Icynene Insulation System® are registered trademarks for polyicynene insulation manufactured by Icynene Inc. Icynene® spray formula is a 1/2 lb density free rise, open celled material.

2.01 MANUFACTURER

A. Icynene® is made on site from liquid components manufactured by Icynene Inc. Installation and on-site manufacturing is supplied by independent Icynene Licensed Dealers.

3.01 PRODUCT DESCRIPTION

A. Icynene® insulates and air seals at the same time. Its performance is less installation sensitive than factory manufactured insulation materials. It is an effective "breathing" air barrier that can adjust with the building to maintain a seal against energy-robbing air leakage for the life of the building. Convective air movement inside cavities is virtually eliminated, providing more uniform temperatures throughout the building. The result is superior quality construction, with higher comfort levels and lower heating and cooling costs. Energy savings vary depending on building design, location, etc. Icynene® is applied by spraying liquid components onto an open wall, crawl space or ceiling surface. There they expand 100: 1 in just seconds to provide a flexible foam blanket of millions of tiny air cells, filling building cavities and sealing cracks and crevices in the process. It adheres to virtually all surfaces, sealing out air infiltration. Excess material is easily trimmed off, leaving a surface ready for drywall or other finish.

4.01 TECHNICAL DATA (Based on Core Samples)

Thermal Performance
Thermal resistance R/in. (RSI/25mm)
ASTM C518: R3.6 hr. ft2 °F/BTU
RSI 0.62 m2 °C/W
Average insulation contribution in stud wall:
2" x 4" = R13 2" x 6" = R20
The Icynene Insulation System® provides more effective performance than the equivalent R-value of air permeable insulation materials. Icynene® is not subject to loss of R-value due to aging, windy conditions, settling, convection or air infiltration; nor is it likely to be affected by moisture related conditions. A FACT SHEET with R-value data is available upon request.

Air Permeance/Air Barrier /Air Seal
The Icynene Insulation System® fills any shaped cavity, and adheres to all materials, creating assemblies with very low air permeance. No additional interior or exterior air infiltration protection is necessary.
Air permeability of core foam:
ASTM E283 data
0.0049 L/S-m2 @75 Pa for 5.25"
0.0080 L/S-m2 @75 Pa for 3.25"
In all buildings, adequate mechanical ventilation/air supply should be provided for optimum IAQ (Indoor Air Quality).
See ASHRAE Guidelines.
Water Vapor Permeance Icynene® is water vapor permeable and allows structural moisture to diffuse and dissipate. It will not entrap moisture in materials to which it is applied.

Water vapor transmission properties:
ASTM E96 data
16 perms 941 ng/(Pa•s•m2) @ 3" (76mm) thick
10 perms 565 ng/(Pa•s•m2) @ 5" (127mm) thick
Because of its low air permeance, Icynene® is not infiltrated by moisture laden air. Computer modeling of moisture movement in walls using a program (MOIST) developed by Doug Burch of the National Institute of Standards and Technology (NIST) suggested that a 1.0 perm rating was not required when Icynene® insulation was used, except in climates as cold or colder than Madison, Wisconsin (7500 Heating degree days). This conclusion was in general agreement with other computer modeling of moisture movement in building envelopes performed in Canada. In those situations that warrant a vapor barrier, the use of low vapor permeable paint on the interior drywall is adequate.

Water Absorption Properties
Icynene® is hydrophobic and does not exhibit capillary properties. It does not wick and is water repellent.Water can be forced into the foam under pressure because it is open celled. Water will drain by gravity rather than travel horizontally or vertically through the foam. Upon drying, thermal performance is fully restored.

Acoustical Properties
Performance in a 2"x4" wood stud wall:
STC Sound Transmission Class - 37
Hz. Freq. 125 250 500 1000 2000 4000
ASTM E90 19 30 31 42 38 46

NRC Noise Reduction Coefficient - 70
Hz. Freq. 125 250 500 1000 2000 4000
ASTM C423 .11 .43 .89 .72 .71 .67

Actual performance is superior than reported test results because of Icynene®'s ability to control air leakage. Burn Characteristics Icynene® will be consumed by flame, but will not sustain flame upon removal of the flame source. It leaves a charcoal residue. It will not melt or drip. It should be applied in accordance with applicable building codes.

U.S.A. Specifications
Surface Burning Characteristics of Icynene® ASTM E84
Flame Spread <20
Smoke Development <400
Fuel Contribution 0
Oxygen Index ASTM D2863 23%
N.Y. State Fire gas toxicity LC50 –12
CANADA Specifications
Corner Wall Test CAN4-S102 FSC3
Flame Spread 510-530
Smoke Development 95-150
ICYNENE® – Spray Formula

Local Dealer:

Healthy Home Spray Foam Insulation
4901 N. US Hwy. 1, Unit-N
Vero Beach, FL 32967

ph: 772-567-1622
Attn. Barbara L. Clark or Don Hall

*****END OF SECTION*****

SECTION 07220 - LIGHTWEIGHT CONCRETE ON INSULPERM BOARD

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 SUMMARY

A. Extent of roof and deck insulation is shown on drawings. Includes light weight insulating concrete and rigid insulation board.

B. Framing for openings, edge angles, wood nailers and structural expansion joints are specified in other sections.

1.03 SUBMITTALS

A. Product Data: Submit manufacturer's literature describing products and methods of mixing and application instructions.

B. Substrate: The applicator shall be responsible for inspection and submit written approval of the substrate as being suitable for the roof insulations system.

C. Certificates: Submit test reports certified by an independent testing laboratory stating that materials and mix intended to be used meet specified requirements.

The cast density shall be checked at the point of placement and the mix adjusted to obtain the specified density. A minimum of 4 test cylinders (3" x 6") shall be taken for each day's work or for each 8 cubic yards of material placed. These specimens shall be protected from any damage and tested in accordance with ASTM C495.

D. A "Performance Warranty" shall be issued to the owner by the insulating concrete manufacturer, through the applicator, upon the completion of the job indicating a minimum average "R" value of 20.4.

1.04 QUALITY ASSURANCE

A. Applicator: An applicator regularly engaged and properly equipped for application of lightweight insulating concrete, and licensed by the manufacturer shall furnish all labor, equipment and supervision for installing the complete roof insulation assembly, including the slotted, corrugated metal decking.

1.05 DELIVERY, STORAGE AND HANDLING

A. Deliver materials in manufacturer's original undamaged packages or acceptable bulk containers clearly marked as to type and grade of material.

B. Store packaged materials to protect them from elements or physical damage.

C. Do not use cement which shows indications of moisture damage, caking, or other sign of deterioration.

1.06 JOB CONDITIONS

A. Do not place lightweight insulating concrete when ambient temperature is below, or expected to fall below 40 degrees F., for the first 72 hours after placement.

B. System to meet elevations and slopes shown on drawings.

PART 2 - PRODUCTS

2.01 MATERIALS

A. Insulating Concrete: ZONOLITE aggregate based concrete as manufactured by W.R. Grace & Co., or equal such as PERLITE.

B. Portland Cement: ASTM C 150, Type I or Type III.

C. Portland Cement: ASTM C 150, Type I or Type III.

D. Aggregate: ASTM C 332, Group I.

E. Water: Clean, potable, free of deleterious amounts of acid, alkai and organic materials.

F. Air Entraining Admixture: ASTM C 260.

G. Control Joint Filler: ASTM C612, Class 2, glass fiber type.

H. Insulation Board: INSULPERM as manufactured by W.R. Grace & Co. It shall have 30 holes and 30 slots in each sheet.

2.02 DESIGN MIX

A. Design lightweight insulating concrete mix to product the following minimum physical properties:

Wet Density at Point of Placement: 52.0 pcf, plus-or-minus 8.0 pcf, when tested in accordance with ASTM C 495.

Oven Dry Density: 25 pcf, plus-or-minus 3 pcf, when tested in accordance with ASTM C 495.
Compressive Strength: Minimum 125 psi, when tested in accordance with ASTM C 495.

B. Do not exceed maximum air content recommended by aggregate manufacturer.

C. Use minimum amount of water necessary to product a workable mix.

PART 3 - EXECUTION

3.01 PREPARATION

A. Control Joints: Install control joints at perimeter of roof deck and at junctures with vertical surfaces, including curbs, walls, and vents, for full depth of insulating concrete.

3.02 INSTALLATION

A. Deck shall be filled with a slurry of insulation concrete to a level of 1/8" above the corrugations before insulation board is installed.

B. Placement of insulation board must be made within 30 minutes of the slurry and installation of the top pour must be made within 4 hours of the insulation board placement.

C. Insulation board shall be placed with joints staggered in a brick-like pattern. Board shall be butted together and placed in a manner that provides full contact of slurry to board, causing the insulating concrete to enter the holes in the board for a locking/keying effect.

D. Place lightweight insulating concrete in accordance with manufacturer's instructions, using equipment and procedures to avoid segregation of mix and loss of air content. Deposit and screed in a continuous operation until an entire panel or section of roof area is completed. Do not vibrate or work mix except for screeding or floating. Place lightweight insulating concrete to depths and slopes as shown on drawings. Leave top surface in acceptable condition to receive subsequent roofing application.

E. Insulating concrete shall be poured with approved equipment. The mixing time shall be sufficient to provide a thorough, consistent mix that will screed to a smooth surface (Min. 2" thickness).

F. Begin curing operation immediately after placement, and air cure for not less than 3 days in accordance with manufacturer's recommendations.

G. Provide temporary protection of removable waterproof covering to prevent direct

exposure to moisture if roofing application is not started immediately after completion of curing.

3.03 FIELD QUALITY CONTROL

A. The General Contractor will engage an independent testing laboratory to take samples and conduct tests to evaluate lightweight insulating concrete.

Take samples in accordance with ASTM C 172, except as modified by ASTM C 495.

Determine wet density in accordance with ASTM C 138.

Determine compressive strength and over dry density in accordance with ASTM c 495. Make at least 6 molds during each placement.

B. Report test results to Architect, Contractor, and lightweight insulating concrete producer within 4 days of completion of each test.

C. Flood test: Prior to commencement of roofing, the deck shall be flood tested by the insulating concrete applicator to insure positive slope to drain. If there is any ponding water or question as to positive drainage, it shall be corrected before placement of roofing materials.

3.04 DEFECTIVE WORK

A. Refinish or remove and replace lightweight insulating concrete surfaces which are too rough to receive finish roofing, or where physical properties do not meet specified requirements, as determined by Architect.

*****END OF SECTION*****

SECTION 07500 - FIBERGLASS-BASED ASPHALT SHINGLES

PART 1 – GENERAL

1.01 The roofing shingles shall be manufactured by one of the following companies: G.A.F., ELK, CertainTeed, Owens Corning, Pabco or TAMKO. Shingles shall carry Underwriter's Laboratories and ASTM Labels:

Wind Resistance of Asphalt Shingles shall be in accordance with Section 1507.2.1 of Chapter 15 of the Florida Building Code. Shingles shall be classified in accordance with ASTM D3161, TAS107 or ASTM D7158 to resist the basic wind speed per the wind map found in Chapter 16 (Figure 1609). Shingles classified as ASTM D3161 Class D or ASTM D7158 Class G are acceptable for use in the 100 mph wind zone. Shingles classified as ASTM D3161 Class F, TAS107 or ASTM D7158 Class H are acceptable for use in all wind zones. Asphalt Shingle wrappers shall indicate compliance with one of the required classifications as shown below per Table 1507.2.1.

TABLE 1507.2.7.1
CLASSIFICATION OF ASPHALT SHINGLES

MAXIMUM BASIC WIND SPEED FROM FIGURE 1609A, B, C or ASCE-7	V_{asd}	ASTM D 7158	ASTM D 3161
110	85	D, G or H	D or F
116	90	D, G or H	D or F
129	100	G or H	D or F
142	110	G or H	F
155	120	G or H	F
168	130	H	F
181	140	H	F
194	150	H	F

UL Class A fire ratingASTM E-108, Class A UL 790, ASTM D-3462
Install shingles to meet requirements of published Manufacturer's instructions.

1.02 Submittals: Color and style sample showing three or four-tab design with a full range of colors available per manufacturer. Product literature and installation procedures. Manufacturer's warranty.

1.03 Deliver materials to site in manufacturer's unopened bundles with labels intact and legible. Handle and Store materials properly and adequately to protect from damage and entrapped water. Store roll goods on end.

1.04 Project Conditions: Proceed with installing shingles only when the weather is appropriate for a quality installation. Do not install underlayment or shingles on wet surfaces.

1.05 Warranty: Warranty terms and conditions apply per Manufacturer with a minimum **30** year limited transferrable warranty.

Workmanship: Applicator warranty covering defects in material and workmanship for a minimum of **One Year.**

PART 2 - PRODUCTS

2.01 Fiberglass/ Asphalt Shingles: as manufactured by G.A.F., ELK, CERTAINTEED, OWENS CORNING or TAMKO. Fiber glass-based asphalt shingles complying with ASTM specifications listed above. Shingles shall have factory applied self-sealing strips or be interlocking. ASTM D3462 is the standard for shingles made with fiberglass felt. Shingles shall be Algae Resistant. Weight per 100 square sq. ft.- **acceptable range is 300 to 355 pounds per square.** Four (4) or five (5) bundles per square. Weight will vary with style and manufacturer. Refer to wall section on the drawings for additional design information.

2.02 Underlayments - **As called out on the wall section** on the drawings and meeting or exceeding these specifications.

A. **No. 30 UL** premium quality TAMKO, or approved equal, organic felt (non-perforated) that is saturated with asphalt. Acceptable for use as an underlayment felt to be applied over the deck prior to the installation of fiberglass/asphalt shingles. UL Laboratories Built-up Type 30 Label in accordance with U.L.55A. ASTM D-226, Type II. 72' X 36" 216 sq. ft. Per roll. Laying lines 2", 12" and 17".

B. **No. 30 ASTM** premium quality TAMKO, or approved equal, organic felt that is saturated with asphalt. Acceptable for use as an underlayment felt to be applied over the deck prior to the installation of fiberglass/asphalt shingles. ASTM D-226, Type II. 72' X 36" 216 sq. ft. Per roll.

C. **No. 30** - Non-UL Saturated Felt features a premium quality TAMKO organic felt (non-perforated) that is saturated with asphalt. Acceptable for use as an underlayment felt to be applied over the deck prior to installation of fiberglass/asphalt shingles. Underwriters Laboratories Prepared Roofing Accessory. 72' X 36" 216 sq. ft. Per roll. Laying lines 2", 4", 12", and 17".

2.03 Hip and Ridge Shingles: Site cut shingles of same color as field of roof or manufactured Hip and Ridge.

2.04 Fasteners: Nails to be hot dipped galvanized or Aluminum with minimum 12-gauge shank and a minimum 3/8 inch head. Nails must be long enough to penetrate at least 3/4 inch into solid decking, or extend a minimum of 1/8 inch through any specified APOA rated sheathing. NO STAPLES will be accepted. Pneumatically applied rotary nailers are acceptable using zinc-coated, 12gauge shank nails.

2.05 Accessories: All accessories must be of compatible materials to the fiber glass-based shingles.

PART 3 - INSTALLATION

3.01 Install roofing systems per the manufacturer's specifications, and in accordance with The Standard Building Code, Current Edition.

3.02 Installers shall be certified installers, certified by the manufacturer of the respective roofing systems. Written proof of certification shall be provided to the Architect prior to installation.

3.03 Upon completion of the roofing system installation, an inspection will be made by a roofing system representative. Corrections to the installation of the roofing system, as deemed necessary by the roofing system representative, will be made at no additional cost to the Owner in order that the Warranty may be issued.

3.04 Shiners (nails applied from above through the plywood deck that missed the trusses or joists, and are visible from below the roof deck), shall be removed by the General Contractor prior to installing any underlayments or finished roofing.

*****END OF SECTION*****

SECTION 07600 - FLASHING & SHEET METAL

PART 1 - FABRICATED SHEET METAL

1.01 GENERAL

A. Conform to profiles and sizes shown on plans, and comply with "Architectural Sheet Metal Manual" by SMACNA, for each general category of work required.

B. Drip Edge – bent to the configuration and dimensions shown on the drawings. Finish as defined on the wall section. If Aluminum Drip, utilize ESP White. If Galvanized Drip prime and paint per Section 09900. If a manufactured metal roofing supplier drip assembly, the metal drip color shall match the metal roofing specified.

C. Seal all seams with epoxy, metal seam cement and, where required for strength, rivet seams and joints.

D. Coat backside of flashing with 15-mil sulfur-free bituminous coating, FS TT-C 494, where required to separate metals from corrosive substrates including cementitious materials, wood or other absorbent materials; or provide other permanent separation.

E. Provide for thermal expansion of running metal work, by overlaps or expansion joints in fabricated work. Where required for watertight construction, provide hooked flanges filled with polyisobutylene mastic for 1" embedment of flanges. Space joints at intervals of not more than 30' for aluminum. Conceal expansion provisions where possible.

1.02 INSTALLATION REQUIREMENTS:

A. Anchor work in place with non-corrosive 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.

B. Seal moving joints in metal work with elastomeric sealants, complying with FS SS-T-00227 - 00230, or 001543.

C. Clean metal surfaces of soldering flux and other substances which could cause corrosion.

D. Performance: Water-tight/weatherproofing performance of flashing is required.

E. Do not install metal flashings over any pressure treated wood without first separating the two with 15# or 30# felt secured with stainless or monel staples.

1.03 SUBMITTALS

A. Contractor to submit manufacturers catalog cuts or shop drawings of all flashing systems as called out on the drawings, for approval by the Architect.

*****END OF SECTION*****

SECTION 07900 - JOINT SEALANTS AND ADHESIVES

PART 1- GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. This Section includes joint sealants for the following applications, including those specified by reference to this Section: following applications:

1. Interior joints in the following vertical surfaces and horizontal non-traffic surfaces:
   a. Control and expansion joints on exposed interior surfaces of exterior walls.
   b. Perimeter joints of exterior openings where indicated.
   c. Tile control and expansion joints.
   d. Vertical joints on exposed surfaces of interior unit masonry concrete walls and partitions.
   e. Perimeter joints between interior wall surfaces and frames of interior doors windows and elevator entrances.
   f. Joints between plumbing fixtures and adjoining walls, floors, and counters.
   g. Other joints as indicated.

2. Interior joints in the following horizontal traffic surfaces:
   a. Control and expansion joints in tile flooring.
   b. Other joints as indicated.

3. Exterior joints in the following vertical surfaces and horizontal traffic surfaces:

   a. Control and expansion joints at Structural Control Joints in masonry wall coursing and in combination with stucco accessories as detailed on the Architectural and Structural plans.
   b. Control and expansion joints in concrete decking as detailed on the Architectural
      and Structural plans.

B. Related Sections include the following:

1. Division 8 Section "Glass and Glazing" for glazing sealants.

2. Division 9 Section "Gypsum Drywall" for sealing perimeter joints of gypsum board partitions to reduce sound transmission.

3. Division 9 Section "Ceramic Tile Work" for sealing tile joints.

1.3 PERFORMANCE REQUIREMENTS

A. Provide elastomeric joint sealants that establish and maintain watertight and airtight continuous joint seals without staining or deteriorating joint substrates.

B. Delete paragraph above or below if not applicable. Revise wording to reflect performance required for both interior and exterior joints. Add specific applications where watertight or water-resistant performance may not be required or attainable with products selected.

C. Provide joint sealants for interior applications that establish and maintain airtight and water-resistant continuous joint seals without staining or deteriorating joint substrates.

D. All sealants and adhesives **used on the interior of the building** (i.e. inside of the weatherproofing system and applied on-site) must comply with the following requirements as applicable to the project scope:

E. **Adhesives, Sealants and Sealant Primers** must comply with South Coast Air Quality Management District (SCAQMD) Rule #1168. Volatile organic compound (VOC) limits listed in the table (see the last page of this spec section) correspond to an effective date of July 1, 2005 and rule amendment date of January 7, 2005.

1.4 SUBMITTALS

A. Product Data: For each joint-sealant product indicated.

B. Samples for Initial Selection: Manufacturer's color charts consisting of strips of cured sealants showing the full range of colors available for each product exposed to view.

C. Delete paragraph above if colors are preselected and specified or scheduled. Retain first paragraph below with or without above.

D. Samples for Verification: For each type and color of joint sealant required, provide samples with joint sealants in 1/2-inch- (13-mm-) wide joints formed between two 6-inch- (150-mm-) long strips of material matching the appearance of exposed surfaces adjacent to joint sealants.

E. Product Certificates: For each type of joint sealant and accessory, signed by product manufacturer.

G. SWRI Validation Certificate: For each elastomeric sealant specified to be validated by SWRI's Sealant Validation Program.

H. Coordinate paragraph below with qualification requirements in Division 1 Section "Quality Requirements" and as supplemented in "Quality Assurance" Article.

I. Qualification Data: For Installer.

J. Preconstruction Field Test Reports: Indicate which sealants and joint preparation methods resulted in optimum adhesion to joint substrates based on preconstruction testing specified in "Quality Assurance" Article.

K. Field Test Report Log: For each elastomeric sealant application.

L. Product Test Reports: Based on comprehensive testing of product formulations performed by a qualified testing agency, indicating that sealants comply with requirements.

M. Warranties: Special warranties specified in this Section.

1.5 QUALITY ASSURANCE

A. Installer Qualifications: Manufacturer's authorized Installer who is approved or licensed for installation of elastomeric sealants required for this Project.

B. Source Limitations: Obtain each type of joint sealant through one source from a single manufacturer.

C. Product Testing: Obtain test results for "Product Test Reports" Paragraph in "Submittals" Article from a qualified testing agency based on testing current sealant formulations within a 36-month period preceding the Notice to Proceed with commencement of the Work.

1. Testing Agency Qualifications: An independent testing agency qualified according to ASTM C 1021 to conduct the testing indicated, as documented according to ASTM E 548.
2. If retaining subparagraph below, also retain "Product Test Reports" Paragraph in "Submittals" Article.
3. Test elastomeric joint sealants for compliance with requirements specified by reference to ASTM C 920, and where applicable, to other standard test methods.
4. Test elastomeric joint sealants according to SWRI's Sealant Validation Program for compliance with requirements specified by reference to ASTM C 920 for adhesion and cohesion under cyclic movement, adhesion-in-peel, and indentation hardness.
5. Test other joint sealants for compliance with requirements indicated by referencing standard specifications and test methods.

D. Pre-construction Field-Adhesion Testing: Before installing elastomeric sealants, field test their adhesion to Project joint substrates as follows:

1. Locate test joints where indicated on Project or, if not indicated, as directed by Architect.
2. Conduct field tests for each application indicated below:
    a. Each type of elastomeric sealant and joint substrate indicated.
    b. Each type of nonelastomeric sealant and joint substrate indicated.
3. Notify Architect seven days in advance of dates and times when test joints will be erected.
4. Report whether sealant in joint connected to pulled-out portion failed to adhere to joint substrates or tore cohesively. Include data on pull distance used to test each type of product and joint substrate. For sealants that fail adhesively, retest until satisfactory adhesion is obtained.
5. Evaluation of Pre-construction Field-Adhesion-Test Results: Sealants not evidencing adhesive failure from testing, in absence of other indications of noncompliance with requirements, will be considered satisfactory. Do not use sealants that fail to adhere to joint substrates during testing.

1.6 PROJECT CONDITIONS

A. Do not proceed with installation of joint sealants under the following conditions:
    1. When ambient and substrate temperature conditions are outside limits permitted by joint-sealant manufacturer or are below 40 deg F.
    2. When joint substrates are wet.
    3. Where joint widths are less than those allowed by joint-sealant manufacturer for applications indicated.
    4. Contaminants capable of interfering with adhesion have not yet been removed from joint substrates.

1.7 WARRANTY

A. When warranties are required, verify with Owner's counsel that special warranties stated in this Article are not less than remedies available to Owner under prevailing local laws. Coordinate with Division 1 Section "Product Requirements."

B. Special Installer's Warranty: Installer's standard form in which Installer agrees to repair or replace elastomeric joint sealants that do not comply with performance and other requirements specified in this Section within specified warranty period.

    1. Warranty Period: Two years from date of Substantial Completion.

C. Special warranties specified in this Article exclude deterioration or failure of elastomeric joint sealants from the following:

    1. Movement of the structure resulting in stresses on the sealant exceeding sealant manufacturer's written specifications for sealant elongation and compression caused by structural settlement or errors attributable to design or construction.

    2. Disintegration of joint substrates from natural causes exceeding design specifications.

3. Mechanical damage caused by individuals, tools, or other outside agents.

4. Changes in sealant appearance caused by accumulation of dirt or other atmospheric contaminants.

PART 2 – PRODUCTS

2.1 MANUFACTURERS

A. See Editing Instructions No. 1 and No. 2 in the Evaluations for cautions about naming manufacturers and products and in coordinating requirements in this Section with other Part 2 articles.

Available Products: Subject to compliance with requirements, products that may be incorporated into the Work include, but are not limited to, products listed in other Part 2 articles.

2.2 MATERIALS, GENERAL

A. Compatibility: Provide joint sealants, backings, and other related materials that are compatible with one another and with joint substrates under conditions of service and application, as demonstrated by sealant manufacturer, based on testing and field experience.

B. Colors of Exposed Joint Sealants: As selected by Architect from manufacturer's full range.

2.3 ELASTOMERIC JOINT SEALANTS

Elastomeric Sealants: Comply with ASTM C 920 and other requirements indicated for each liquid-applied chemically curing sealant specified, including those referencing ASTM C 920 classifications for type, grade, class, and uses related to exposure and joint substrates.

B. Stain-Test-Response Characteristics: Where elastomeric sealants are specified to be nonstaining to porous substrates, provide products that have undergone testing according to ASTM C 1248 and have not stained porous joint substrates indicated for Project.

C. Suitability for Contact with Food: Where elastomeric sealants are indicated for joints that will come in repeated contact with food, provide products that comply with 21 CFR 177.2600.

D. Single-Component Nonsag Polysulfide Sealant:

1. Available Products:

a. Pacific Polymers, Inc.; Elastoseal 230 Type I (Gun Grade).
b. Polymeric Systems Inc.; PSI-7000.

2. Type and Grade: S (single component) and NS (nonsag).
3. Class: 25.
4. Use Related to Exposure: NT (nontraffic).
5. Uses Related to Joint Substrates: M, G, A, and, as applicable to joint substrates indicated, O.

2.4 LATEX JOINT SEALANTS

A. Latex Sealant: Comply with ASTM C 834, Type P, Grade NF.

B. Available Products:

1. Pecora Corporation; AC-20+.
2. Sonneborn, Division of ChemRex Inc.; Sonolac.
3. Tremco; Tremflex 834.

2.5 ACOUSTICAL JOINT SEALANTS

A. Acoustical Sealant for Concealed Joints: Manufacturer's standard, nondrying, nonhardening, nonskinning, nonstaining, gunnable, synthetic-rubber sealant recommended for sealing interior concealed joints to reduce airborne sound transmission.

1. Available Products:

a. Pecora Corporation; BA-98.
b. Tremco; Tremco Acoustical Sealant.

2.6 JOINT-SEALANT BACKING

A. General: Provide sealant backings of material and type that are nonstaining; are compatible with joint substrates, sealants, primers, and other joint fillers; and are approved for applications indicated by sealant manufacturer based on field experience and laboratory testing.

B. Elastomeric Tubing Sealant Backings: Neoprene, butyl, EPDM, or silicone tubing complying with ASTM D 1056, nonabsorbent to water and gas, and capable of remaining resilient at temperatures down to minus 26 deg F. Provide products with low compression set and of size and shape to provide a secondary seal, to control sealant depth, and to otherwise contribute to optimum sealant performance. Backing rods used in combination with silicone sealants shall be soft rod "open cell" to prevent off-grassing bubbles in the cured surface. All other backing rods shall be "closed cell".

C. Bond-Breaker Tape: Polyethylene tape or other plastic tape recommended by sealant manufacturer for preventing sealant from adhering to rigid, inflexible joint-filler materials or joint surfaces at back of joint where such adhesion would result in sealant failure. Provide self adhesive tape where applicable.

D. When proposing paintable silicones using acrylic latex paints make special consideration that these products must be painted within seven days of placement of sealants. Refer to manufacturer's literature for proper sequence of applications.

2.7 MISCELLANEOUS MATERIALS

A. Primer: Material recommended by joint-sealant manufacturer where required for adhesion of sealant to joint substrates indicated, as determined from preconstruction joint-sealant-substrate tests and field tests.

B. Cleaners for Nonporous Surfaces: Chemical cleaners acceptable to manufacturers of sealants and sealant backing materials, free of oily residues or other substances capable of staining or harming joint substrates and adjacent nonporous surfaces in any way, and formulated to promote optimum adhesion of sealants to joint substrates.

C. Masking Tape: Nonstaining, nonabsorbent material compatible with joint sealants and surfaces adjacent to joints.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine joints indicated to receive joint sealants, with Installer present, for compliance with requirements for joint configuration, installation tolerances, and other conditions affecting joint-sealant performance.

B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

A. Surface Cleaning of Joints: Clean out joints immediately before installing joint sealants to comply with joint-sealant manufacturer's written instructions and the following requirements:

1. Remove all foreign material from joint substrates that could interfere with adhesion of joint sealant, including dust, paints (except for permanent, protective coatings tested and approved for sealant adhesion and compatibility by sealant manufacturer), old joint sealants, oil, grease, waterproofing, water repellents, water, surface dirt, and frost.

SECTION 08100 - HOLLOW METAL DOOR AND FRAMES

PART 1 - GENERAL

1.01 RELATED WORK SPECIFIED ELSEWHERE

A. Wood Doors	Section 08200
B. Finish Hardware	Section 08700
C. Painting	Section 09900

1.02 QUALITY CRITERIA

Hollow Metal Work shall be manufactured by one of the following or equal:

A. Ceco Corporation
B. Steelcraft
C. Firedoor Corporation of Florida
D. Quality Engineered Products Co., Inc., Tampa, FL
E. Republic Steel Doors & Frames, Pembroke Park, FL
F. Amweld Building Products, Inc.
G. Curries

1.03 SUBMITTALS: SHOP DRAWINGS

A. Submit shop drawings in accordance with Contract Conditions, covering each type of door and frame, frame conditions, and complete anchorage details, supplemented by suitable schedules covering doors and frames.

B. Show glass and louver opening sizes and locations in doors.

1.04 DELIVERY, STORAGE AND HANDLING

A. Delivery:
Deliver products to the job site in their original unopened containers or wrappings clearly labeled with the manufacturer's name and brand designation, door schedule number, referenced specification number, type, class and rating as applicable.

B. Storage:
Store products in an approved dry area; protected from contact with soil and from exposure to the elements. Keep products dry at all times.

C. Handling:
Handle products in a manner that will prevent breakage and damage to products.

PART 2 - PRODUCTS

2.01 MATERIALS

A. Frames (Door)

1. Exterior: 16 gauge A-60 galv. coated, bonderized sheet steel.
   Exterior: 14 gauge A-60 galv. coated bonderized sheet steel, over 6'-0" in width. **NOTE: Provide 3/4" back bents on all frames mounted to brick veneers or prefinished split-faced masonry products in lieu of the standard 1/2".**

2. Interior: 16 gauge A-60 galv. coated bonderized sheet steel.
   Interior: over 4'-0: in width, 14 gauge. **NOTE: Provide 3/4" back bents on all frames mounted to brick veneers or prefinished split-faced masonry products in lieu of the standard 1/2".**

B. Hardware Reinforcement (Frames) - Steel

1. Hinges: 7 gauge by 1-1/2"or 1-5/8" x 10"

2. Closers and holders: 12 gauge by 16"

3. Strikes: 1-1/4" x 4-7/8"ANSI 16gauge
   1-1/8" x 2-3/4" strike reinf. 16 gauge
   1-1/8" x 3-1/2" deadlock strike 12 gauge
   1-1/8" x 2-3/4" strike reinf. No lip 16 gauge

C. Frames (Window)

1. Exterior: 14 gauge A-60 galv. coated, bonderized sheet steel

2. Interior: 16 gauge A-60 galv. coated, bonderized sheet steel

D. Doors

1. Exterior:
   Face sheets 16 gauge A-60 galv. coated bonderized sheet steel. SDI 100 Grade III, Model 2, full flush, hollow metal, seamless construction. Closed top and bottom edges flush with face sheets. Extra heavy duty.

2. Interior:
   Face sheets 16 gauge A-60 galv. coated bonderized sheet steel. SDI 100 Grade III, Model 3, full flush, hollow metal, seamless construction. Closed top and bottom edged flush with face sheets.

3. Internal Stiffeners:
   Currie 707 with polystyrene core or approved equal.

4. Sound Deadening:
   Type standard with the manufacturer.

5. Hardware Reinforcement - Steel:

a.	Hinges:	7 ga. x 1-1/2" or 1-5/8" x 10"
b.	Closers and Holders:	12 ga. x 1-3/4" x 10"
c.	Locks:	7 ga. x 1-1/4" x 3"
d.	Push/pull plates:	16 ga. x 14" x 14"
e.	Panic bars:	3" x 8" and 4" x 24" (24 ga.)
f.	Glazing and louver beads:	18 ga.
g.	Coordinator Reinf.:	12 ga. x 1-3/8" x 15-1/2"

6. Clips, Anchors, Bolts, Screws and Rivets:
   Steel, types standard with the manufacturer.

7. Metallic filler: FS TT-F-322

8. Shop Primer:
   Baked-on rust-inhibitive. ASTM - B117 Federal Specification TT-P-636

9. Field Painting: See Section 09900

2.02 FABRICATION

A. Frames

1. Formed to profile as shown on drawings, constructed with square corners, and free of defects, warps or buckle.

2. Welded-type for concrete, masonry construction and metal stud construction.

3. Corners and connections welded with exposed welds ground flush and smooth.

4. Reinforcement:
   As per Section 2.01 B,(3) above.

5. Frames punched to receive rubber silencers, three each door on lock side and two at head of double doors.

6. Provide removable spreaders attached to bottom of door frames, to insure correct alignment during shipping and installation.

7. At angle type thresholds, notch frames and extend exterior portion down to lower floor level.

8. Provide sheet metal grout guards in frames at all lock bolts and tapped

hardware locations.

9. Do not fill frames with mortar unless specifically called out on the drawings.

10. Do not fill mullions, including removable mullions, with mortar unless specifically called out on the drawings.

11. Silencers shall be installed in frames after doors are installed and painting is completed.

B. Anchors

1. Provide 16-gauge angle shaped floor clips welded to jambs and punched for two 3/8" diameter bolts each.

2. Provide adjustable length clip angles as required.

3. Jamb Anchors

a. Frames set in masonry:
For doors not more than 7 ft. High, provide not less than three 10" long adjustable 14 gauge corrugated galvanized masonry anchors for each jamb over 7 feet, not less than 4 for each jamb.

b. Frames set against previously placed masonry or concrete:
For doors not more than 7 feet high, by approval of Owner's representative only punch each frame jamb and dimple countersink for not less than three 3/8" diameter flat head screws. For doors over 7 feet high, punch less than four 3/8" diameter flat head screws. Provide pipe sleeves with spacers welded into each jamb at each fastening location. Provide 3/8" diameter galvanized steel flat head screws with approved expansion anchors or toggles as required. After installing flat head screws fill head of countersink screw with body filler then sand flush with frame.

c. Frames set in metal stud partitions:
Provide 16-gauge metal jamb anchor clips welded in each jamb at following locations:
One at top, one 12" down from top and 24" o.c. for remainder of jamb frames.

C. Doors

1. Internal stiffeners spaced at not over 6" o.c.

2. Face sheets spot welded to internal stiffeners at not over 5" apart and in a manner that will prevent the welds from showing on the exposed side of face sheets.

3. Hardware reinforcement welded in place as required for hardware application. (See Section 2.02).

4. Sound deadening:
   Interior surfaces treated with a sound deadening material to eliminate metallic ring.

5. Provide 16 gauge pre-bonderized zinc coated steel perimeter channels. Bevel stile edges 1/8" in 2".

6. Spot-weld channels to face sheets 3" o.c.

7. Close tops of all exterior out swinging doors flush with steel channels. Close flush and seal watertight.

8. Grind welds off smooth and flush.

9. Fold edge construction not acceptable.

10. At angle type thresholds, extend height of door by one inch over height indicated in Door Schedule.

D. Doors With Glass Panels

1. Openings formed so that no bead is required on outside face of doors.

2. Bead provided on both faces of doors and secured with oval head countersink screws on the inside face.

E. Doors with Louvers

1. Interior:
   Provide 18-gauge elector zinc coated bonderized sheet steel louver frames and inverted "Y" type louvers full thickness of door, welded into doors.

2. Provide special size and shape louvers as shown.

3. Louver Door Security Panels:
   Woven wire mesh. Furnish and install on all interior metal louver doors.

F. Fire Door Assemblies

1. Fire door assemblies, including frames and hardware, shall meet fire test and rating requirements in accordance with the procedure of Underwriters Laboratories or Factory Mutual Laboratories. Provide appropriate labels on doors and frame.

2. Fabrication and assembly requirements necessary to obtain labels will take precedence over requirements shown or specified, except where requirements shown or specified exceed the sizes or gauges required for labeling.

3. Required ratings are as shown on drawings.

G. Finish Hardware Coordination

Metal doors and frames shall be prepared at the factory for application of finish hardware at the job site. Templates are to be supplied by the finish hardware manufacturer to assure accurate preparation of doors and frames in accordance with the Hardware Schedule.

H. Shop Painting by Manufacturer

1. Imperfections spot glazed with metallic filler and sand smooth.

2. Doors and frames shall be cleaned thoroughly in preparation to receive manufacturer's shop primer.

3. After cleaning and treating the frames, the manufacturer shall apply a coat of baked-on-rust-inhibiter primer prior to shipping.

PART 3 - EXECUTION

3.01 INSTALLATION

A. General:

1. Install new doors and frames in locations shown on drawings. Thoroughly clean and prime prior to installation.

2. Install new window frames in locations shown on drawings. Thoroughly clean and prime prior to installation.

3. Prior to applying finish paint, areas where prime coat has been damaged shall have any rust removed, sanded smooth and touched up with same primer as applied at shop.

4. Finish paint doors and frames as indicated in Section 09900 PAINTING, in colors as called out on the Interior Design Plans or Painting Schedule.

B. Deliver the work, ready to set up and erect in place as rapidly as the general construction work permits. Set work in place in accordance with approved setting drawings, in plumb and level positions, strongly secured against displacement and with built-in anchors. In masonry construction, set frames in advance of masonry work.

C. Fastening:
Secure each frame floor clip to concrete floor with two 3/8" diameter cadmium plated bolts set in drilled tamp-ins or self-drilling concrete anchors. Install jamb anchors as called for in 2/02, B.3. NOTE: Do not fill any frames with mortar unless specifically called out on the plans.

D. Frames Installation Tolerances: Adjust standard steel door frames for squareness, alignment, twist, and plumb to the following tolerances:

1. Squareness: Plus or minus 1/16 inch, measured at door rabbet on a line 90 degrees from jamb and perpendicular to frame head.
2. Alignment: Plus or minus 1/16 inch, measured at jambs on a horizontal line parallel to plane of wall.
3. Twist: Plus or minus 1/16 inch, measured at opposite face corners of jambs on parallel lines, and perpendicular to plane of wall.
4. Plumbness: Plus or minus 1/16 inch, measured at jambs at floor.

E. Standard Steel Doors Installation Tolerances: Fit hollow-metal doors accurately in frames, within clearances specified below:

Non-Fire Rated Standard Steel Doors

1. Jambs and Head: 1/8 inch plus or minus 1/16 inch.
2. Between edges of pairs of doors: 1/8 inch plus or minus 1/16 inch.
3. Between bottom of door and top of threshold: Maximum 3/8 inch.
4. Between bottom of door and top of finished floor (no threshold): Maximum 3/4 inch.

Fire-Rated Steel Doors

1. Install doors with clearances in accordance with NFPA 80.

F. Bracing:
Brace frame jambs and heads receiving poured concrete adequately to resist deflection: brace frames in masonry walls and partitions adequately so the walls and partitions may be erected against same.

G. Install doors after masonry work and plastering have been completed and accurately fit and adjust doors to work properly. Application of finish hardware and door installation is specified in Division 8.

3.02 CLEAN-UP

A. Upon completion of installation, clean surfaces of doors and frames by the procedure recommended by the Door Manufacturer.

B. Clean up all rubbish and debris caused by this work and remove from the site. Leave areas surrounding openings in a broom-clean condition.

*****END OF SECTION*****

SECTION 08700 - FINISH HARDWARE

PART 1 - GENERAL

1.01 WORK NOT INCLUDED

A. Rough Hardware
B. Casework Hardware
C. Installation of Hardware

1.02 GENERAL

A. All exterior doors shall open outward or in direction of travel to an exit.

B. Copies of the Hardware Schedule, templates and keying schedules shall be submitted to the Architect and approved before ordering.

C. Exchange schedules and template lists, with related trades, for coordination with their Shop Drawings.

1.03 GUARANTEE

A. The hardware supplier shall provide a written guarantee that all materials furnished under this Section will be free from defects in the materials and the workmanship for a period of one (1) year from the date of a final **"Certificate of Occupancy".**

B. The hardware supplier, after a complete and thorough inspection by the Architect, shall further certify that all items furnished under this Section have been properly located, in accordance with the Hardware Schedule and the manufacturer's instructions.

1.04 SUBMITTALS

A. Three (3) copies of the Hardware Schedule, complete with catalog cuts, shall be submitted for approval. Door numbers and hardware groups are not to be changed.

B. Approval of the Hardware Schedule shall be for type, operation and finish only.

1.05 DELIVERY

A. Each item of hardware shall be delivered to job site, packaged separately, complete with the necessary fasteners, screws and anchors. Provide templates and/or instructions as required.

B. Mark each item so as to correspond with the Hardware Schedule, identifying

contents and defining location.

PART 2 - PRODUCTS

2.01 HINGES

A. All Hinges shall be STANLEY, HAGER, McKINNEY.

B. Use three hinges per door leaf on all doors up to a door height of 7'-6"and width up to 3'-0". Add an extra hinge for each additional twenty-four (24) inches of door height and widths over 36" to a maximum of 48".

C. Provide the following size and type hinges unless otherwise noted in the hardware groups which takes priority. Provide non-removable pins for exterior doors.

1. **Exterior Doors:**
   4-1/2" x 4-1/2", Stainless Steel

2. **Interior Doors with Closers:**
   4-1/2" x 4-1/2", US26D finish

3. **Interior Doors without Closers:**
   4-1/2" x 4-1/2", US26D finish

D. Finish

1. Exterior Doors: Stainless Steel
2. Interior Doors: Satin Chromium Plated Finish

2.02 LOCKS & EXIT DEVICES

A. All locksets shall be AS SPECIFIED ON THE HARDWARE SCHEDULE. All locks shall have a minimum throw of ½". Finish to be per the Finish Hardware Schedule. Functioning of the locks shall be as designated in the hardware groups.

B. Locksets shall comply with the following additional requirements:
1. The hardware manufacturer will meet with the **SCHOOL DISTRICT** to finalize keying requirements and to obtain keying instructions in writing.
2. All cylinders will be 6-pin interchangeable core type. All cylinders will be keyed to the existing key system.
3. All cylinders will be supplied with Temporary construction cores. Construction Cores and keys will be a different keyway (key section) than the final cores.
4. The following will be provided by the Contractor:
   a. 3 change keys each cylinder

b. 4 Construction keys
c. 2 Construction core removal keys
d. 2 Each of all GGMK, GMK and MK's used in the system
e. Catalog cuts and parts manuals

5. All keys shall be stamped "DO NOT DUPLICATE".

2.03 CLOSING DEVICES

A. All hydraulic door closers shall be provided by one manufacturer and guaranteed for five (5) years.

B. Door Closers shall be LCN, HAGER at all doors per schedule, fully hydraulic, full rack and pinion action. Closers shall have a separate adjustment for latch speed, general speed and back check. All closers and accessories, except special purpose types, whether applied to hinge side, stop face, over door or on bracket, shall be non-handed. All closers are to be installed on the room side of the door except where noted in the Hardware Schedule. All closers are to be installed with thru-bolts and five screws in the foot.

2.04 STOPS

A. Wall Stops shall be AS SPECIFIED ON THE HARDWARE SCHEDULE, NOTE: Utilize Rockwood Model 409, US26D/626 at all doors that have push button locks. This model has a larger diameter recessed receiving hole. Wall stops to be utilized on interior/exterior frame walls to have solid wood backing to prevent drywall failure. Wall Stops WB11 should be mounted to the wood base. Areas with Vinyl or Ceramic Tile Base should utilize the wall stops 50C/60C.

2.05 THRESHOLD, WEATHERSTRIP

A. Thresholds and Weather stripping shall be PEMKO, HAGER to match the types and sizes indicated on the Hardware Schedule or detailed on the drawings.

B. Provide screws and anchors as required.

C. Finish to be per Schedule.

2.06 PLACEMENT OF HARDWARE

Various items shall have the following heights and locations, unless otherwise indicated. (Heights are shown from finish floor to center line of item):

A. Hinges: Standard Placement

B. Cylindrical Lockset 38"

C. Closer per manufacturer template to give maximum degree of opening. All closers to be mounted on room side of door.

D. Stops:
   1. Wall: On wall where knob or pull hits.
   2. Floor: As per standard practice.
   3. Chain Door: As per standard practice.
   4. Over-Head: Per manufacturer template to give maximum degree of opening. All Over-Head stops to be mounted on room side of door.

PART 3 - EXECUTION

3.01 KEYING

A. All installed locksets shall be keyed to the Owner's satisfaction. Coordinate with Owner as to manufacturer, function and type prior to ordering specified locksets.

B. Submit keying schedule, based on the instructions and prior approval of the Owner's representative, for final approval before ordering locksets.

C. Delivery

1. All locks are to be delivered to the job site without the permanent key. All locks are to be keyed to the existing Owner's master key, if required.

2. A representative of the Hardware Supplier, upon the completion of the project, shall check all locks for proper location, operation and keying as well as deactivate the construction-key operation and transfer all locks to a permanent key operation.

3. All permanent keys shall be properly identified and tagged with a code number and location and shall be turned over directly to the Owner's representative.

4. Furnish six (6) master keys of each set to the Owner.

3.02 DESCRIPTION OF HARDWARE GROUP NUMBERS

The following Hardware Schedule is to be used as a general guide. Special or unusual conditions not covered in the schedule will have hardware of a similar type and quality to meet the job conditions, and it shall be the hardware consultant's responsibility to ensure that all hardware is supplied to meet job requirements and produce a complete job.

*****END OF SECTION*****

Door/Hardware Index

Door #	HWSet #
01	3
02	3
03	1
04	1
05	1
06	1
07	2
10	4
11	4
12	5
13	5
14	3
15	3
16	3
8	4
9	4

SpeXtra: 315324 Ver. #3 09/25/2018
SRHS LOCKER RENOVATION

Hardware Group No. 1

For use on mark/door #(s):
03 04 05 06

Each To Have:

Qty		Description	Catalog Number	Finish	Mfr
3	EA	HW HINGE	5BB1HW 4.5 X 4.5 NRP	630	IVE
1	EA	INTRUDER DB LOCK	ML2062 NSA CT6	626	C-R
2	EA	PERMANENT CORE	8000-6	626	C-R
1	EA	SURFACE CLOSER	4040XP CUSH TBSRT	689	LCN
1	EA	KICK PLATE	8400 8" X 2" LDW	630	IVE
1	EA	WALL STOP/HOLDER	WS445	626	IVE
1	EA	RAIN DRIP	346C	AL	PEM
1	SET	SEALS	2891APK	AL	PEM
1	EA	THRESHOLD	2005AV	AL	PEM

VERIFY ALL HARDWARE WITH CURRENT FBC NOA REQUIREMENTS
VERIFY KEYING WITH OWNER

Hardware Group No. 2

For use on mark/door #(s):
07

Each To Have:

Qty		Description	Catalog Number	Finish	Mfr
3	EA	HINGE	5BB1 4.5 X 4.5 NRP	630	IVE
1	EA	DORMITORY LOCK	ML2065 NSA CT6	626	C-R
1	EA	PERMANENT CORE	8000-6	626	C-R
1	EA	SURFACE CLOSER	4040XP CUSH TBSRT	689	LCN
1	EA	KICK PLATE	8400 8" X 2" LDW	630	IVE
1	EA	RAIN DRIP	346C	AL	PEM
1	SET	SEALS	2891APK	AL	PEM
1	EA	THRESHOLD	2005AV	AL	PEM

VERIFY ALL HARDWARE WITH CURRENT FBC NOA REQUIREMENTS
VERIFY KEYING WITH OWNER

Hardware Group No. 3

For use on mark/door #(s):
01 02 14 15 16

Each To Have:

Qty		Description	Catalog Number	Finish	Mfr
3	EA	HINGE	5BB1 4.5 X 4.5 NRP	630	IVE
1	EA	MORTISE LOCK	ML2059 NSA CT6	626	C-R
1	EA	PERMANENT CORE	8000-6	626	C-R
1	EA	SURFACE CLOSER	4040XP CUSH TBSRT	689	LCN
1	EA	KICK PLATE	8400 8" X 2" LDW	630	IVE
1	EA	WALL STOP	WS402CVX	626	IVE
1	EA	RAIN DRIP	346C	AL	PEM
1	SET	SEALS	2891APK	AL	PEM
1	EA	DOOR SWEEP	3452AV 36"	AL	PEM
1	EA	THRESHOLD	2005AV	AL	PEM

VERIFY ALL HARDWARE WITH CURRENT FBC NOA REQUIREMENTS
VERIFY KEYING WITH OWNER

Hardware Group No. 4

For use on mark/door #(s):
10 11 8 9

Each To Have:

Qty		Description	Catalog Number	Finish	Mfr
3	EA	HW HINGE	5BB1HW 4.5 X 4.5	630	IVE
1	EA	PUSH PLATE	8200 8" X 16"	630	IVE
1	EA	PULL PLATE	8305 10" 4" X 16"	630	IVE
1	EA	SURFACE CLOSER	4040XP TBSRT	689	LCN
1	EA	MOP PLATE	8400 4" X 1" LDW	630	IVE
1	EA	KICK PLATE	8400 8" X 2" LDW	630	IVE
1	EA	WALL STOP	WS402CVX	626	IVE
3	EA	SILENCER	SR64	GRY	IVE

Hardware Group No. 5

For use on mark/door #(s):
12 13

Each To Have:

Qty		Description	Catalog Number	Finish	Mfr
3	EA	HINGE	5BB1 4.5 X 4.5	652	IVE
1	EA	MORTISE LOCK	ML2057 NSA CT6	626	C-R
1	EA	PERMANENT CORE	8000-6	626	C-R
1	EA	SURFACE CLOSER	4040XP HCUSH TBSRT	689	LCN
1	EA	KICK PLATE	8400 8" X 2" LDW	630	IVE
3	EA	SILENCER	SR64	GRY	IVE

VERIFY KEYING WITH OWNER

SECTION 09100 - LATHING AND STUCCO

1.01 GENERAL

A. All applicable provisions of the General Conditions are a part of this section.

B. Furnish all labor, materials, tools, equipment, etc., and services necessary and incidental to the complete fabrication, furnishing and erection of this section as shown, noted, detailed and reasonably implied on the drawings and in the specifications.

C. All lathing, plastering, and stucco work, in addition to conforming to this section, shall conform to the American National Standards Specifications A42.2 and A42.3.

1.02 MATERIALS

Stucco

A. Do not use any precolored stucco mixes.

B. Premix stucco bag mix shall conform to ASTM C-926, Gray.

C. Sand shall be clean, sharp, fine, sand conforming to ASTM C-144.

D. Water shall be clean, fresh, portable and free from mineral organic substances that would affect the set of stucco.

Metal Lath

A. Self-furring metal lath shall be expanded metal lath with staggered indentations spaced 3 - ½" apart horizontally and 2" apart vertically with indentations of depth to hold lath a minimum of 1/4" away from back-up material. Lath shall be hot dipped galvanized for interior and exterior use and shall weigh 3.4 pounds per square yard.

B. Metal lath to be used where supports are spaced over 16" on centers shall be hot dipped galvanized, expanded metal lath stiffened with 3/8" ribs spaced 4" on center, weighing a minimum of 3.4 pounds per square yard.

C. Sheets secured to supports at intervals not exceeding six inches (6"). Place ties where sides of sheets lap at supports, and at side laps or sheets between supports. Tie wire to be not less than 18 ga. galvanized wire.

D. Diamond-mesh lath lapped at sides not less than ½" and at ends not less than 1". End laps of sheets should generally occur only over supports; if between, end of

sheets to be laced or adequately tied with #18 ga., galvanized, annealed wire.

E. No paper backed laths will be accepted. Remove paper backings on any laths supplied to the job site. Utilize 30# felt roofing paper or backing as called out on the plans.

F. Install according to ASTM C 1063.

1.03 MIXING AND APPLICATION

A. Before the application of stucco masonry, all surfaces shall be clean and free from defect. Concrete surfaces to receive stucco shall be coated with a bonding agent to insure proper bond. Dampen masonry surfaces with a fog spray immediately prior to application so as to prevent excessive withdrawal of moisture from the stucco.

B. Stucco shall be applied in three (3) coats to a total thickness of 3/4" over specified metal lath and in two (2) coats to a total thickness of 5/8" on concrete or masonry. Finish coat to be installed as per manufacturer's recommendations of approximately 1/4" thickness with **surface finishes as scheduled on the building elevation drawings.** When textured surfaces are specified, troweled or sprayed, the General Contractor shall submit a 2' X 2' sample board to the Architect for approval, **PRIOR** to applying the finish coating of stucco to the building.

C. Cross rake all scratch coats in order to form a mechanical bond with brown coats. Lightly cross-scratch all brown coats of plaster in order to form a mechanical bond with the finish coat.

D. Keep each base coat moist for at least 48 hours; commence moistening as soon as plaster is hardened sufficiently to prevent injuries. If atmospheric conditions are hot and dry, curing time shall be extended as necessary to at no additional cost to the Owner. Allow base coat to cure for a minimum of seven (7) days before applying finishing coat.

E. **FINISH COAT**, when scheduled as a sponge finish, shall be free from waves, dents, trowel marks, and shall be a smooth sponge finish. Do not deviate more than plus or minus 1/4 inch in 10 feet from a true plane in finished surfaces.

F. Plaster and stucco used for patching and replacing existing work shall be mixed, applied and finished to match adjacent surfaces.

G. Apply stucco in accordance with ASTM C-926.

1.04 CLEANING

A. After completion of work, all scaffolding, tools, and other equipment shall be removed from the building, taking care not to damage work of other trades. All cement plaster rubbish shall be removed and the building left broom clean.

B. Stucco Contractor is responsible for protecting all existing work, windows, doors, equipment, etc. from stucco residue during application. Clean any residue that may exist at completion of work.

1.05 STUCCO ACCESSORIES

NOTE: REFER TO PLANS, SECTIONS, DETAILS AND ELEVATIONS FOR SPECIFIC TYPE AND PLACEMENT PER PROJECT.

A. Casing Beads:

1. For interior use shall be formed of 24-gauge Galvanized Steel, ASTM A525-81, A527-80, A446 (.0179 thickness G90 galv.).

2. For exterior use, where scheduled, shall be formed of Solid Zinc Alloy, type #66 as manufactured by U.S. Gypsum Company, #66 as manufactured by Inland Steel Company, type #66X as manufactured by Keene Products or an approved comparable product. Zinc shall be Alloy 190, ASTM B69-89 (.0179 thickness).

3. For exterior use, where scheduled, shall be Rigid Vinyl (PVC, Unplasticized Polyvinyl Chloride), type 6658 or 6675 as manufactured by Vinyl Corporation, or an approved comparable product. ASTM D-1784-81 cell class 13244C.

B. Interior corner beads shall be fabricated of 26 ga. galvanized, type 1, as manufactured by National Gypsum Co., 1-A as manufactured by National Gypsum Co., 1-A as manufactured by U.S. Gypsum Co., or #1 as manufactured by Inland Steel Products Co., or an approved comparable product.

C. Control Joints, Expansion Joints, Channel Reveals

1. For exterior use, where scheduled, on flat vertical and horizontal surfaces shall be Solid Zinc Alloy as manufactured by U. S. Gypsum Company, Inland Steel Company, Keene Products, or an approved comparable product. Profiles and configurations vary greatly; refer to plans and details for product numbers and applications.

2. For exterior use, where scheduled, shall be Rigid Vinyl (PVC, Unplasticized Polyvinyl Chloride), as manufactured by Vinyl Corporation or an approved comparable product. Profiles and configurations vary greatly; refer to plans and details for product numbers and applications. ASTM D-1784-81 cell class 13244C. ASTM C1063-86.

D. Inside corner Expansion Joints for interior or exterior applications, when scheduled or depicted on the drawings, shall be vinyl, Model 3058 or 3075, as manufactured by Vinyl Corporation, or an approved comparable product. ASTM D-1784-81 cell class 13244C. ASTM C1063-86.

E. Fascia Drip Screed for exterior application, when depicted or scheduled on the drawings, shall be vinyl, Model DS 15-75 by Vinyl Corporation, or Model 540-75 by Plastic Components, or an approved comparable product meeting ASTM D-1784-81 cell class 13244C, and ASTM C-1063-86.

1.06 EXECUTION

A. Quality - Follow recommendations and specifications for strict installation. Allow adequate time for each of three (3) coats to dry before going on with the next coat.

B. Stucco Accessories:

1. The stucco contractor **shall request a project walk-around with the Architect prior to installing any exterior stucco and exterior stucco accessories,** to insure all conditions, materials, and applications are understood.

2. Corner beads, for interior applications only, shall be installed on all corners and edges of corner openings. Corner beads shall extend the full height of the corners on which they are applied and shall act as a ground.

3. Casing beads shall be applied where stucco stops and other products begin, or where indicated on plans and details.

4. When applying vinyl products, all intersections, end butts and end miters shall have manufacturer's approved sealant placed at raw edges to adhere the sections prior to application of stucco.

C. Metal lath shall be applied with long dimension of sheet across supports.

D. Control Joints and Expansion Joints shall be installed in exact locations shown, or as to check shrinkage and expansion cracks. **Do not fill any throats of control joints with sealants.** Painting of all stucco accessories is recommended.

E. Inside-Corner Expansion Joints shall be installed in exact locations shown on details.

*****END OF THIS SECTION*****

SECTION 09230 - CEMENT BACKING BOARD

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

Drawings and general provisions of Contract, including general and supplementary conditions and Division-1 Specifications Sections, addenda apply to work of this section.

1.02 RELATED WORK OF OTHER SECTIONS

Lightgage Metal Framing	Section 05400
Rough Carpentry	Section 06100
Gypsum Wallboard	Section 09250
Ceramic Tile	Section 09300

1.03 DESCRIPTION

Extent of cement backing board system work is shown on Drawings and Schedules for areas receiving ceramic tile.

1.04 QUALITY ASSURANCE

A. Obtain cement board from a single manufacturer.

B. Single-Installer Responsibility: A single installer shall perform the work of this section; and shall be a firm specializing in this work for at least 3 years, capable of showing successful installations similar to work required for project, using recommended attachment screws and spacing of screws.

C. ANSI A108.11-1999: Interior installation of cementitious backer units.

1.05 SUBMITTALS

Submit manufacturer's product data, specifications; and installation instructions for the cement board systems.

1.06 DELIVERY, STORAGE AND HANDLING

A. Deliver materials to the job site in the original packages, containers, or bundles bearing the brand name and manufacturer's identification.

B. Store materials in dry locations with adequate ventilation, free from water and in such a manner to permit easy access for inspection and handling. Stack cement boards flat to avoid sagging or damage to edges, or surfaces.

C. Handle cement boards to prevent damage. Protect metal framing members from being bent or damaged. Protect gypsum panels in same manner as cement boards.

PART 2 - PRODUCTS

2.01 MANUFACTURER

A. Subject to compliance with requirements, provide DUROCK Cement Board System as manufactured by the United States Gypsum Company, unless otherwise indicated.

B. Equivalent systems of other manufacturers will be accepted under conditions as set forth in the contract conditions.

C. Materials:

1. Glass Mesh Mortar Unit (Cement Board): USG DUROCK Exterior Cement board ½" x 4' x 8'.

2. Cement board fasteners:
   a. Non-wet areas- 1 1/4", DUROCK Screws: wafer head with anti-corrosive coating. Heads recessed or counter sunk.
   b. Wet areas- 1 1/4", DUROCK Screws: wafer head stainless steel. Heads recessed or countersunk.

D. Joint Reinforcement: DUROCK Tape (2" wide). **NOTE:** This portion of the work is to be performed by the Ceramic Tile contractor per Section 09300.

E. Metal Framing: Comply with ASTM 0645: Manufactured by the United States Gypsum Company Min. 22 ga. Must meet ASTM A446, A525, A568, A463.

PART 3 - EXECUTION

3.01 INSTALLATION:

A. Install metal framing in accordance with manufacturer's instructions. Stud spacing not to exceed 16 in. o.c. Provide double studs at ends of each board.

B. Install cement board with rough side facing out and vertical edges over double supports. Stagger joints in successive courses. Install adjacent board closely but not forced.

C. Fasten boards to framing with DUROCK screws. Space fasteners 8" o.c. at walls. Locate perimeter fasteners at least 3/8" from edges. Counter sink screw heads slightly beneath the board surface. Provide firm board contact with framing. Pre-

drill edge screw locations to prevent breaking at edges.

D. Joint Reinforcement Tape and Mortar Skim Coat: Apply tape over board joints and interior corners. Do not overlap. **NOTE:** This portion of work to be performed by the Ceramic Tile Contractor per Specification Section 09300.

E. Ceramic Tile: Comply with application requirements of Division-9 Section 09300.

F. In wet areas, or areas subject to wash down due to periodic maintenance, install moisture barrier on top of cement board. **NOTE:** This portion of the work to be performed by the Ceramic Tile Contractor per specification Section 09300.

*****END OF SECTION*****

SECTION 09250 - GYPSUM DRYWALL

1.01 GENERAL

A. Gypsum Board Standard: ASTM C 840

B. As manufactured in the United States by one of the following approved companies:
   1. United States Gypsum Co.
   2. National Gypsum Co.
   3. Georgia-Pacific Gypsum Co.

1.02 MATERIALS

A. Drywall Materials: Exposed Gypsum Board ASTM C 36

   1. Long Edges: Standard taper
      a. ½" Gypsum Drywall (Regular).
      b. ½" Moisture-Resistant Gypsum Drywall.
      c. 5/8" Gypsum Drywall (Regular).
      d. 5/8" Moisture-Resistant Gypsum Drywall.
      e. 5/8" Type-X Fire Resistant Gypsum Drywall.
      f. 5/8" Vandal Resistant (High Impact) Gypsum Drywall.

B. Trim Accessories: Provide manufacturer's standard metal trim accessories, of the beaded type with face flanges for concealment in joint compound except where semi-finishing or exposed type is indicated. See plans and details for specific locations and conditions.

C. Provide corner beads at external corners. Install with nails or screws at minimum of 16" on center. No crimp bead will be accepted unless in combination with nails or screws. As an alternate use Ultratrim-Outside 90 as manufactured by No-Coat. www.no-coat.com 1-888-662-6281

D. Provide edge trim of the shape indicated where edge of gypsum board would otherwise be exposed or semi-exposed; L-type for abutment at edges, other U-type except special kerfed-type where kerf is provided in adjoining work. See plans and details for specific locations and conditions.

E. Gypsum Board Fasteners: Self drilling, self-tapping, bugle head, screws.

F. Joint tape: ASTM C 475, performed, Type II.

G. Joint Compound: ASTM 475, Type I.

H. Provide water-resistant type MR manufactured by United States Gypsum

Company for use with water-resistant backing board and cementitious substrate backing board.

1.03 DRYWALL INSTALLATION AND FINISHING

A. Install gypsum boards in lengths and directions which will minimize number of end joints, and avoid end joints in central area of ceilings. Install walls and partitions with exposed gypsum boards vertical, with joints offset on opposite sides of partitions. Otherwise, install boards with edges perpendicular to supports, with end joints staggered over supports, except where recommended in a different arrangement by manufacturer. Install as per UL#U305 for 1-hour rating when utilizing rated panels or as specified on the Life Safety Plans.

B. Form "Floating": Construction for gypsum boards at internal corners, except where special isolation or edge trim is indicated.

C. Screw gypsum boards to supports.

D. Drywall Finishing: Except as otherwise indicated, apply joint tape and joint compound at joints (both directions) between gypsum boards. Apply compound at accessory flanges, penetrations, fasteners heads and surface defects.

E. Apply compound in three (3) coats (plus prefill of cracks where recommended by manufacturer); sand after last two (2) coats to achieve a **Level 4 or Level 5 finish** per U.S. Gypsum Corporation guidelines. Refer to the **Room Finish Schedule** for level of finish required for this project.

F. Ceiling Finish as per **Finish Schedule** on the Construction Plans. Where a textured ceiling is called for on the drawings the drywall finisher shall provide a 24" X 24" sample board for approval by the Owner prior to applying any finished ceiling textures.

G. The drywall installer shall notify the General Contractor of walls out of plumb in the vertical or horizontal direction, as well as the absence of proper wall, soffit, overhead deadwood blocking, pipe and wire plate protectors prior to installing drywall. Finished walls shall be no more than 3/16" out of dead straight within any (six) 6-foot direction. Walls not conforming to this standard shall be removed and replaced at the General Contractors expense.

H. The drywall contractor shall remove all debris associated with his portion of the work and remove all dried finishing compound from the floors. All scrap drywall sections must be taken to a scrap yard by the subcontractor for recycling of the gypsum product.

*****END OF THIS SECTION*****

SECTION 09300 - CERAMIC TILE/PORCELAIN TILE/DIMENSIONAL STONE WORK

1.01 GENERAL

A. Coordination: Coordinate all with other trades whose work affects, connects with, or is concealed by tile installations. Before proceeding, make certain all required inspections have been made by local officials and the Architect.

B. Scope of work:
   1. Preparation of substrate and installation of ceramic tile on walls, floors, and ceilings.
   2. Preparation of substrate and installation of dimensional stone on floors and walls.
   3. Preparation of substrate and installation of porcelain tile on floors.
   4. Installation of waterproofing membrane on prepared substrate.

1.02 RELATED WORK IN OTHER SECTIONS

1. Lightgauge Metal Framing	Section 05400
2. Rough Carpentry	Section 06100
3. Lathing and Stucco	Section 09100
4. Cement Backing Board	Section 09230
5. Toilet Accessories	Section 10800
6. Floor Drains and Shower Drains	Section 15421
7. Sealants and Adhesives	Section 07900

1.03 QUALITY STANDARDS

A. Conform to applicable portions of the following:
   1. ANSI A108.1A: Installation of ceramic tile in the wet-set method, with Portland cement mortar.
   2. ANSI A108.1B: Installation of ceramic tile on a cured Portland cement mortar setting bed with dry-set or Latex-Portland cement mortar.
   3. ANSI A108.5: Installation of ceramic tile with dry-set Portland cement mortar or Latex-Portland cement mortar.
   4. ANSI A108.13: Installation of load bearing, bonded, waterproof membranes for thin-set ceramic tile and dimension stone.
   5. ANSI A118.4: Specifications for Latex-Portland cement mortar.
   6. ANSI A108.8: Installation of ceramic tile with chemical resistant furan resin mortar and grout.
   7. ANSI 137.1: Porcelain Tile. (ISO standard is equivalent for porcelain manufactured outside the United States).
   8. Tile Council of America, Inc.: The Industry's Guide for Installation Practices most current edition.

1.04 SUBMITTALS

A. Submit samples of all ceramic tiles, porcelain tile and dimensional stone scheduled for installation.
B. Submit samples of the waterproofing membrane/system proposed for installation.
C. Submit manufacturer's product data for tile setting compound and grout proposed for installation.

2.01 PRODUCTS

A. Recommended Materials:

1. Ceramic tile and dimensional stone: As selected by the Architect or the Interior Designer. See the Drawing Schedules.
   a. All ceramic floor tile located in areas that may become slippery when wet shall have a **non-slip** impervious surface. The tile must meet a coefficient of friction of 0.5 to 0.6 using a wet/dry test.

2. Porcelain Tile: shall have a Water Absorption Rate of 0.5% or less, shall have Abrasion Resistance of IV or V, shall have a Hardness on the Moh's Scale of 7 to 9. Tiles shall be Rectified (mechanically ground edges) with 1/8" grout lines.

3. Thin set adhesive per manufacturers recommendations and specification standards of 'The Tile Council of America' and meeting the Low-Emitting requirements of Specifications Section 07900.

4. Marble: Window stools shall be Georgia or Alabama White domestic marble, cultured marble, or an approved, comparable product, unless specified otherwise on the drawings.

5. Waterproofing Membrane: Laticrete 9235 waterproofing membrane in combination with Laticrete Reinforcing Membrane installed in accordance with manufacturer's recommendations.

6. Mortar: Laticrete 4237 latex Thin Set Mortar Additive with Laticrete 211 Crete Filler Powder.

7. Grout: Laticrete Spectra Lock Pro Grout in color selected by the Architect.

3.01 EXECUTION

A. Inspection of Surfaces:

1. Examine surfaces to receive tile, cement substrate backing board, setting beds, pressure treated wood blocking for mounting of toilet accessories and grab bars and accessories, before installation begins.

2. Tile contractor shall be responsible for preparing installed cement backing board including taping of joints and mortar skimming of all faces to a true and level surface prior to installation of any ceramic tile.

3. Walls to receive ceramic tile shall not be out of level and true planes more than 1/8" in 24 inches.4. Do not proceed with installations until unsatisfactory conditions are corrected.

B. Product delivery, storage and handling: Deliver all manufactured materials in original, unbroken containers bearing name of manufacturer, brand and grade seals. Keep materials dry, clean, and protected against deterioration in any form.

C. Installation:

1. Layout all work so that where possible no tiles less than half size occur. In any event install no half tiles above first course up from the bottom or away from first vertical course at internal and external corners. Align all joints, vertically and horizontally. Cut and drill neatly without marrying tile. Rub smooth any necessary cuts with a fine stone and set no cut edge against any fixture, cabinet, or other tile without a joint at least 1/16" wide. Cut, fit, adjust, and establish tiles neatly and accurately to accommodate accessories, interruptions, chases, returns, mechanical and electrical outlets, and finish at their exact location (as determined by jobsite conditions). Maximum variation shall be plus-or-minus- 1/8" in 2 feet when straight edge is laid on the surface in any direction.

2. Provide all required trim pieces as detailed for the various tiles specified.

3. All floor and wall tile to be set using thin-set products as called out in this section. Utilize proper admixes for exterior installations and frost proof applications. When installing porcelain tile utilizing modified thinset, adhere to guidelines stipulated in ANSI 118.4.

4. Thoroughly wash out joints and saturate with clean water before grouting. Thoroughly grout into all joints to fill entire length and depth. Fill flush with face of tiles making a neatly finished, smooth surface. Prevent staining of grouted joints by applying a clear sealer to all exposed grout joints.

5. Provide preformed metal control joints at door openings and sufficient to isolate maximum areas of 25' X 25'. Color of control joint preformed infill to match the selected grout.

6. Installation of **waterproofing membrane** shall be behind all tiles, full height and full width within showers or areas subject to periodic washdown or wetting as scheduled maintenance. Utilize materials as specified within this section. Insure proper slopes to floor drains. Insure the membrane is installed continuous into drain or adjacent to drains utilizing a perimeter weep hole design. Wall membrane laps over the shower pan membrane. Do not penetrate the membrane with any fasteners within 24 inches above the finished floor tile. Test shower receptor and drainage fitting for leaks before commencing tile work. When installation of grab bars is required, set all concealed stainless steel fasteners in a bed of waterproof white sealant conforming with the Low Emitting requirements in Specifications Section 07900.

3.02 CLEANING AND PROTECTION

A. Wipe surfaces clean after grouting, remove all traces of mortar and grout. Do not use acid solution for cleaning glazed tile.

B. Close spaces to traffic or other work until tile is firmly set. Protect all work from damage at no additional cost to Owner.

*****END OF SECTION*****

SECTION 09900 - PAINTING

1.01 GENERAL

1. Submittals:

   a. 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. Submittals must also include material requirements data per Article 1.08.

   b. On 8" x 8" hardboard, provide two (2) samples of each color and material, with texture to simulate finish conditions.

   c. On wood surfaces provide two (2) 4" x 8" samples for natural and stained wood finish.

   d. On actual wall surfaces and other building components, duplicate painted finishes of acceptable samples, for approval by the Architect.

1.02 DESCRIPTION OF WORK

1. Painting and finishing of interior and exterior items and surfaces, unless otherwise indicated.

2. Paint exposed surfaces, except as otherwise indicated, whether or not colors are designated. If not designated, colors will be selected by Architect from standard colors available for the coatings required.

3. Work Not Included: Unless otherwise indicated, shop priming of ferrous metal items and fabricated components are included under their respective trades. Unless otherwise indicated, painting not required on surfaces of concealed areas. Finished metals such as anodized aluminum, stainless steel, bronze, and specialty 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.

1.03 DELIVERY AND STORAGE

1. Deliver materials to job site in new, original, and unopened containers bearing manufacturer's name, trade name, and label analysis. Store where indicated in accordance with manufacturer's instructions.

1.04 PROTECTION:

1. Protect work of other trades. Correct any painting related damage, by cleaning, repairing or replacing, and refinishing, as directed by Architect.

1.05 PROJECT CONDITIONS:

1. Apply paints only when temperature of surfaces to be painted and ambient air temperatures are between 50 and 98 degrees. Do not apply paints in rain, fog or mist; when relative humidity exceeds 95 percent; at temperatures less than 5 degrees F above the dew point; or to damp or wet surfaces.

2. 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. Surface Conditions: Apply paint and coatings when the following surface conditions have been met:

    a. Interior Drywall - 12% maximum moisture content.

    b. Exterior Stucco and Cementitious Wall Panels- 12% maximum moisture content.

    c. Exposed Wood, Wood Doors, Wood Trim- 15% maximum moisture content.

1.06 EXTRA MATERIALS:

1. Provide a minimum of 1 gallon of each material and color of paint as materials applied that are packaged and stored with identification labels describing contents.

1.07 SURFACE PREPARATION:

1. Perform preparation and cleaning procedures in strict accordance with coating manufacturer's instructions of each substrate condition.

2. Remove hardware and accessories, machined surfaces, plates, lighting fixtures and similar items in place that are not to be finish-painted or provide surface-applied protection. Re-install removed items and remove protective coverings at completion of work.

3. Seal all wood required to be job-painted. Prime edges, ends, face, undersides and backsides of counters, cases, fascias, soffits, cabinets, counters, etc.

4. Back-prime with one coat on interior paneling only where masonry, plaster, or other wall construction occurs on backside.

5. Seal tops, bottoms, and cut-outs of wood doors with heavy coat of quick drying sealer immediately upon delivery to job. Do not paint door UL Labels.

1.08 MATERIAL REQUIREMENTS:

1. Paints and coatings used on the interior of the building (i.e., inside of the weatherproofing system and applied on site) must comply with the following criteria as applicable to the project scope:

    a. Architectural paints and coatings applied to interior walls and ceilings must not exceed the volatile organic compound (VOC) content limits established in Green Seal Standard GS-11, Paints, 1st Edition, May 20, 1993.
    b. Anti-corrosive and anti-rust paints applied to interior ferrous metal substrates must not exceed the VOC content limit of 250 g/L established in Green Seal Standard GC-03, Anti-Corrosive Paints, 2nd Edition, January 7, 1997.
    c. Clear wood finishes, floor coatings, stains, primers, sealers and shellacs applied to interior elements must not exceed the VOC content limits established in South Coast Air Quality Management District (SCAQMD) Rule 1113, Architectural Coatings, rules in effect on January1, 2004.

1.09 MATERIAL PREPARATION:

1. Mix, prepare, and store painting and finishing materials in accordance with manufacturer's directions.

1.10 APPLICATION:

1. Apply painting and finishing materials in accordance with manufacturer's directions. Use applicators, and techniques best suited for materials and surfaces to which applied, but in no case will spray application be used unless approved by Architect.

2. Apply additional coats when undercoats, stains, or other conditions show through final paint coat, until paint film is of uniform finish, color and appearance.

3. Paint surfaces behind movable equipment same as similar exposed surfaces. Paint surfaces behind permanently fixed equipment with prime coat only before equipment is installed.

4. Finish exterior doors on tops, bottoms and edges same as exterior faces, unless otherwise indicated. Do not paint door UL Labels.

5. Sand lightly between succeeding enamel, urethane or varnish coats.

6. Omit first coat (primer) on metal surfaces which have been shop-primed and touch-up painted, unless otherwise specified.

7. Apply prime coat to material which is required to be painted or finished, and which has not been prime coated by others.

8. Apply each material at not less than the 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.

9. Provide a total dry film thickness of not less than 2.5 mils for entire coating system of prime and finish coat for two (2) coat work.

1.11 COMPLETED WORK:

1. Match approved samples for color, texture and coverage. Remove, finish or repaint work not in compliance with specified requirements.

1.12 TOUCHING UP AND CLEANING:

1. Upon completion, all touching up as required shall be done and paint removed from all surfaces which are not specified to receive paint.

1.13 PAINT, GENERAL:

1. Material Compatibility:

   a. Provide materials for use within each paint system that are compatible with one another and substrates indicated, under conditions of service and application as demonstrated by manufacturer, based on testing and field experience.

   b. For each coat in a paint system, provide products recommended in writing by manufacturers of topcoat for use in paint system and on substrate indicated.

1.14 PAINTING SCHEDULE

The following paints specified shall be manufactured by one of the following manufacturer's or an approved, comparable product:

Benjamin Moore Paints
Sherwin Williams Paints
Porter Paints
Devoe Paints
MAB Paints
ICI Paints

Armourcoat, USA

NOTE: Color selections to be by the Owner, the Architect, and/or the Interior Designer. See Finishes Schedule on the plans for location of paint. When more than five (5) colors are selected for interior or for exteriors, a painting upcharge shall be negotiated prior to application of paints.

A. Exterior wood Trim, Wood Siding, Wood Fascias & Soffits, Etc.:	One (1) coat sealer primer on all faces and edges Two (2) coats Benjamin Moore Exterior Acrylic Latex paint on exposed surfaces.

B. Interior Drywall: Two (2) coats Benjamin Moore Regal AquaVelvet Eggshell (319) over base sealer coat. Specialty finishes may apply also.

C. Galvanized Metal: One (1) coat Benjamin Moore Galvanized Iron Primer. Two (2) coats Benjamin Moore Meta-lastic Paint.

D. Metal Surfaces: Structural Steel Beams & Columns, Wall girts, Roof purlins, Fire Sprinkler Riser Assemblies, Steel Trusses, Steel Tanks:

Exterior Exposed – Two (2) coats Benjamin Moore Retard-X Rust Inhibitive Latex Primer 162 over the shop delivered primer, welds and bolts. Allow a minimum of 4 hours between coats. Finish with two (2) coats Benjamin Moore Eggshell alkyd house paint 108.

Interior Exposed – Same applications but one (1) coat only of latex Primer 162.

NOTE: All galvanized metal to be washed with mineral spirits to remove any oil.

E. Exterior Stucco and Cementitious Wall coats One (1) coat Benjamin Moore Masonry sealer. Two (2) Benjamin Moore Latex, or Acrylic Latex paint. Flat finish.

F. Steel Doors & Frames: Spot prime any scratches in factory primer with Benjamin Moore Iron Clad Rust Inhibiter Red Oxide. Finish with (2) coats Benjamin Moore oil based or water based enamel, (semi-gloss).

G. Wood Doors and (When Finish Schedule calls for Painted): Trim (Interior) One (1) coat sealer primer. Two (2) coats Benjamin Moore oil based enamel, (semi-gloss).

H. Wood Doors and (When Finish Schedule calls for Sealed): Trim (Interior) Three coats of Satin Finish clear urethane, lightly sanded between coats.

I. Interior Aluminum or Steel Handrails: One coat metal primer and two coats shop applied industrial enamel, or factory powder coating, (both gloss finish).

J. Exposed finish Grade Concrete Block: One coat block filler and sealer primer. Specialty Paint, two (2) coats acrylic latex, over primer in accordance with the Manufacturers Specifications.

K. Exterior Aluminum Tubing, Handrails, Guardrails, Caps, Cast Trim and Frames: Powder coated after completed fabrication and assembly and prior to installation. Powder Coat RAL standard color as specified on Architectural Details.

L. Exterior Architectural Masonry Units (such as decorative split faced, split ribbed, and smooth faced colored block, and any manufactured stone such as Herpel), including the mortar used to set the units, shall be sealed with a water repellent-anti graffiti coating after installation and cleaning of all block faces. **EXCEPTION:** If the block manufacturer supplies an integral water repellent admixture in their block and a water repellent is added to the grout (mortar) during installation, then no exterior sealer is required.

M. Toilet Room Walls: Apply water base epoxy coating full height on the wall materials scheduled in toilet rooms/bathrooms, to achieve an impervious finish.

NOTE: DO NOT APPLY EPOXY PAINTS TO ANY INTERIOR FACES OF BARE BLOCK AT MASONRY EXTERIOR WALLS. UTILIZE LATEX PAINTS WITH BREATHABILITY OF 1 PERM OR GREATER.

1. **ON INTERIOR MASONRY** - Semigloss Finish using Sherwin Williams Paints.

    a. **1st coat**: S-W KEM CATI-COAT EPOXY FILLER/SEALER B42 WA8/B42 WA9 (87-108 sq. ft./gal @ 8-10 mild dry).

    b. **2nd coat**: S-W Water Based Catalyzed Epoxy B70/B60 V25.

    c. **3rd coat**: S-W Water Based Catalyzed Epoxy B70/B60 V25, (8mils wet, 3 mils wet per coat).

2. **ON DRYWALL** - Semi-Gloss Finish using Sherwin Williams Paints.

    a. **1st coat**: S-W PrepRite 200 Latex Primer, B28W200, (4 mils wet, 1.2 mils dry).

    b. **2nd coat**: S-W Heavy Duty Epoxy, B67 Series/B60 V3. (3 mils dry per coat)

    c. **3rd coat**: S-W Heavy Duty Epoxy, B67 Series/ B60 V3. (3 mils dry per coat)

N. Stained Concrete Floors when called for on Finish Schedule: Two coats solid color stain material as per Specification Section 09940. Apply over a clean, cured, dry, dirt and dust free, lightly broomed finished concrete slab. Color as selected by the Architect. Make a special effort to never apply concrete sealers to any surface to receive concrete stains.

O. Specialty Coatings, when scheduled on the Interior Finish Schedule, shall be placed in accordance with manufacturer's specification for application and protected until the project is occupied by the end user.

P. Specialty coatings approved, when scheduled on the interiors include:
    a. Amourcoat
    b. Polymix

***** END OF THIS SECTION*****

SECTION 10155 - SOLID PLASTIC TOILET PARTITIONS

PART I - 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 SUMMARY

Extent of toilet partitions as indicated on drawings.

Types of toilet compartments include: 1" thick, solid plastic (polymer) homogenous in color.

Styles of toilet compartments include: Floor-anchored, overhead braced, with integral hinge system.

Styles of screens include: Floor-anchored, wall hung, and overhead braced.

Toilet accessories, such as toilet paper holders and grab bars, are specified elsewhere in Section 10800.

1.03 SUBMITTALS

A. Product Data: Submit manufacturer's detailed technical data for materials, fabrication, and installation, including catalog cuts of anchors, hardware, fastenings, and accessories.

B. Recycled Content: Indicate recycled content; indicate percentage of pre-consumer and post-consumer recycled content per unit of product.

C. Local/Regional materials: Indicate location of manufacturing facility; indicate distance between manufacturing facility and the project site.

D. Submit environmental data in accordance with Table 1 of ASTM E2129 for products provided under work of this section.

E. Verify that plastic products to be incorporated into this Project are labeled in accordance with ASTM D1972.

F. Shop Drawings: Submit shop drawings for fabrication and erection of toilet partition assemblies not fully described by product drawings, templates, and instructions for installation for installation of anchorage devices built into other work. Backing in walls and ceilings supplied under Section 06100.

G. Samples: Submit full range of color samples for each type of unit required. Submit 6" square samples of each color and finish on same substrate to be used in work, for color verification after selections have been made.

1.04 QUALITY ASSURANCE

A. Field Requirements: Take field measurements prior to preparation of shop drawings and fabrication where possible, allowing for acceptable tolerances, to ensure proper fittings of work.

B. Coordination: Furnish inserts and anchorages which must be built into other work for installation of toilet partitions and related work; coordinate delivery with other work to avoid delay.

C. Regulatory Requirements: Conform to ANSI A117.1 and FBC Chapter 11 codes for access for the handicapped operation of toilet compartment door and hardware and screens for urinal access.

PART 2 - PRODUCTS

2.01 MANUFACTURERS

Manufacturer: Subject to compliance with requirements, provide products of one of the following:

Accurate Partitions Div., U.S. Gypsum Co.
Bobrick Washroom Equipment, Inc.
Santana Products Company
AMPCO, Hialeah, FL
Capitol Partitions, Inc.
Global Steel Products Corporation
Rockville Partitions Inc.
Columbia Partitions, a division of PSISC

2.02 MATERIALS

A. General: Provide materials that have been selected for surface flatness and smoothness. Exposed surfaces that exhibit pitting, seam marks, roller marks, stain, discoloration, telegraphing of core material, or other imperfection on finished units are not acceptable.

B. Solid Plastic: High Density Polyethylene (HDPE) with homogenous color throughout. Provide material not less than 1" thick, seamless construction with edges eased to a radius of .250".
   1. Recycled Content: Minimum 20% post-consumer recycled content OR a

minimum of 40% pre-consumer recycled content at Contractor's option.

C. Pilaster Shoes: ASTM A 167, Type 302/304 stainless steel, not less than 3" high, 20-gauge, finished to match hardware. Anchor to finish floor with plastic anchors and #14 X 1 ½" star head security pin, stainless steel screws.

D. Stirrup Brackets: Manufacturer's standard design for attaching panels to walls and pilaster, either chromium-plated non-ferrous cast alloy ("Zamac") or anodized aluminum. Continuous stirrups required.

E. Edging Strips: Anodized aluminum.

F. Hardware and Accessories: Manufacturer's standard design, heavy-duty operating hardware and accessories of chromium-plated non-ferrous cast alloy ("Zamac").

G. Wall Brackets: Full length, continuous, (6063-T Alloy) with mill finish weighing not less than .822 lbs. per linear foot. Wall brackets shall be pre-drilled by manufacturer with holes spaced every 6" along full length of brackets. Wall brackets shall be thru-bolted to panels and pilaster with one-way anti-theft bolts. Attachment of brackets to adjacent wall construction shall be accomplished by (1) theft proof Zamac mushroom nail in head anchor directly behind the vertical edge of panels and pilasters at every 12" along the full length of bracket and (2) No. 5 plastic anchors and No. 14 x 1 1/4" stainless steel phillips head screws at each 12" interval alternately spaced between anchor connections.

H. Headrail: Shall be heavy aluminum extrusion (6063-T6 Alloy) with mill finish in anti-grip configuration weighing not less than 1.88 lbs. per linear foot. Headrail shall be fastened to tops of pilasters and headrail brackets by thru-bolting with star-head security pins, stainless steel barrel bolts (no cadmium plated bolts will be accepted).

I. Headrail Brackets: Shall be of 16 or 18-gauge stainless steel.

J. Anchorages and Fasteners: Unless otherwise indicated, use manufacturer's standard exposed fasteners of stainless steel, with theft-resistant type heads and nuts.

2.03 FABRICATION

A. General: Furnish standard doors, panels, screens, and pilasters fabricated for partition system, unless otherwise indicated. Furnish units with cutouts, drilled holes, and internal reinforcement to receive partition-mounted hardware, accessories, and grab bars, as indicated.

B. Door Dimensions: Unless otherwise indicated, furnish 24" wide inswinging doors for ordinary toilet stalls and 32" to 36" wide (clear opening) outswinging or inswinging doors at stalls equipped for use by handicapped. See plans for sizes

and configurations of stall components.

C. Doors: Fabricated 55" in length to be mounted 13" A.F.F. with edging strip fastened to full bottom edge unless stipulated otherwise on interior elevations.

D. Pilasters: 82" high and fastened to floor and to wall brackets with pilaster shoes.

E. Overhead-Braced Partitions: Furnish galvanized steel supports and leveling bolts at pilasters, as recommended by manufacturer to suit floor conditions. Make provisions for setting and securing continuous extruded aluminum anti-grip overhead-bracing at top for each pilaster. Furnish shoe at each pilaster to conceal supports and leveling mechanism.

F. Floor-Supported Screens: Furnish pilasters not less than 1" in thickness, panels and pilasters of same construction and finish as toilet partitions. Furnish specified anchorage devices, complete with threaded rods, lock washers, and leveling adjusting nuts at pilasters, to permit structural connection to floor. Furnish shoe at pilaster to conceal anchorage.

G. Hardware: Furnish hardware for each compartment partition system, as follows:

H. Hinges: Heavy aluminum extrusion (6063-T6 Alloy) with bright dip anodized finish with wrap around flanges, and thru-bolted to doors and pilasters with one-way anti-theft bolts. Hinges will be factory set to a full close position unless otherwise noted. (Recessed flush mounted hinges not acceptable).

I. Door Pull: Heavy chrome plated Zamac. Include wall stop in handicapped stall.

J. Coat Hook/Bumper: Heavy chrome plated Zamac with rubber bumper.

K. Door Strike and Keeper: Heavy aluminum extrusion (6063-T6 Alloy) with bright dip anodized finish with wrap-around flange surface, mounted, and thru bolted to pilaster with one-way anti-theft bolts.

L. Door Latch Housing: Heavy aluminum extrusion (6063-T6-Alloy) with bright dip anodized finish surface mounted and thru-bolted to door with one-way ant-theft bolts. Slide bolt and bottom shall be heavy aluminum with "Tough-Coat Black" finish.

2.04 FINISHES

A. Surface: Of all Polymer Resin components to be similar and equal to "Plasti-Glaze 280" by Santana products Co., or approved manufacturer listed. Colors are to be selected from manufacturer's standard colors by Architect and confirmed during the submittal process with a maximum of two colors.

PART 3 - EXECUTION

3.01 INSTALLATION

A. General: Comply with manufacturer's recommended procedures and installation sequence. Install partitions rigid, straight, plumb, and level. Provide clearances of not more than 1/2" between pilasters and panels, and not more than 1" between panels and walls. Secure panels to walls with not less than two stirrup brackets attached near top and bottom of panel. Locate wall brackets so that holes for wall anchorages occur in masonry or tile joints. Secure panels to pilasters with not less than two stirrup brackets located to align with stirrup brackets at wall. Secure panels in position with manufacturer's recommended anchoring devices.

B. Overhead-Braced Partitions: Secure pilasters to floor and level, plumb, and tighten installation with devices furnished. Secure overhead-brace to each pilaster with not less than two fasteners. Hang doors and adjust so that tops of doors are parallel with overhead-brace when doors are in closed position.

C. Screens: Attach with concealed anchoring devices, as recommended by manufacturer to suit supporting structure. Set units to provide support and to resist lateral impact.

3.02 ADJUST AND CLEAN

A. Hardware Adjustment: Adjust and lubricate hardware for proper operation. Set hinges on inswinging doors to hold open approximately 30 degrees from closed position when unlatched. Set hinges on outswinging doors (and entrance swing doors) to return to fully closed position.

B. Cleaning: Clean exposed surfaces of partition system using materials and methods recommended by manufacturer, and provide protection as necessary to prevent damage during remainder of construction period.

*****END OF SECTION*****

SECTION 10260 - CORNER GUARDS

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

Drawings and general provisions of Contract, including General and Supplementary Conditions and Division - Specification sections, apply to work of this section.

1.02 DESCRIPTION OF WORK

Furnish and install, as detailed, as located on the Drawings, at all exterior doors with drywall corners, and at corridor interior corners C/S Acrovyn Surface Mounted Corner Guard 90 degree Models SM20, SSM-20 and the 135-degree Model SM-20M. All as manufactured by Construction Specialties, Inc. or an approved equal. Complete details, locations and samples of selected models and colors, including end caps, and mounting hardware shall be submitted to the Architect for approval.

1.03 APPROVED MANUFACTURER'S OR EQUAL

Construction Specialties, Inc., Acrovyn
Arden Architectural
Balco Metalines, Inc.
IPC/InPro Corp.
Korogard, RJF International Inc.
Pawling Corporation, Pro Tek

1.04 MATERIAL

Corner guards shall be manufactured from .078" thick nominal high impact vinyl/acrylic extrusions, designed to absorb and resist abrasions under impact. The extrusion shall include a matte finish pebblette grain surface, and be supplied in a **Solid Color as called out on the Interiors Plan or Finish Schedule**. Continuous retainers shall be a minimum .063" thickness. End caps and mounting hardware shall be furnished to complete the assembly.

1.05 DESIGN

Corner guards shall be securely locked in place yet provide for free-floating action to absorb heavy impact without damage to guard, retainer or adjacent wall. Corner guard shall be straight and true over full length.

1.06 PERFORMANCE

Vinyl/acrylic extrusions shall be U.L. tested, Classified and Labeled reflection a Class I Fire Rating in accordance with UL=723 (ASTM-E84-91a) (CAN 4S102-2-M83 in Canada) test procedures. Chemical and stain resistance shall be per CSAV-280 standards, established by manufacturer.

Color shall be integral with components matched in accordance with SAE J-1545-(Delta E) with color difference no greater than 1.0 units using the Hunter (Lab) scale. Impact tested in accordance with applicable provisions of ASTM-F476-76.

*****END OF THIS SECTION*****

SECTION 10440 - SPECIALTY SIGNS

PART I - 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

Areas of specialty signage may include:

1. Construction Signs
2. Exterior Handicapped Signs at Parking Areas
3. Toilet Room Handicapped Signs
4. Interior Room Number and Name Signs
5. Occupancy Capacity Signs
6. Regulatory Signs

1.03 QUALITY ASSURANCE

Uniformity of Manufacturer: For each sign form a graphic image process indicated furnish products of a single manufacturer.

Americans with Disabilities Act: All signage shall meet the requirements of the A.D.A. including grade 2 braille raised lettering, etc.

As manufactured by one of the following approved companies:

ASI Sign Systems, Tampa, FL (813) 620-4360 Attn: Ilene
Advance Corporation, Braille-Tac (800) 825-0150
The Southwell Corp. San Antonio, TX (210) 223-1831
Best Manuf. Sign Systems (800) 235-2378
Bunting Graphics Inc. (800) 735-0445
FRS Industries (800) 747-4795
HART Arch. Signage, Chesapeake, VA (804) 420-1666
Mohawk Sign Systems, Schenectady, NY (518) 370-3433
Metallic Arts, Spokane, WA 1-800-541-3200
In-Pro Signscape, Muskego, WI, inprocorp.com

1.04 SUBMITTALS

A. Shop Drawings: Submit shop drawings for all items in this Section including all accessories.

B. Submit samples of all interior signage and graphics.

PART II - PRODUCTS

2.01 ENVIRONMENTALLY FRIENDLY MATERIALS

A. Signage materials for interior signage only, shall include at a minimum, the following:
   1. Up to 60% of product is comprised of renewable paper resources
   2. 3 to 5% pre-consumer recycled content
   3. Paper-based materials; no chemically formulated substrates
   4. NEMA Class A fire-rated "self-extinguishing"
   5. Raw materials regionally extracted and manufactured
   6. Low VOC paints and finishes
   7. GREENGUARD Indoor Air Quality Certified materials

2.02 CONSTRUCTION SIGN

A. Furnish and install 8' - 0' long x 4' - 0' high construction sign, on 3/4 plywood.

B. Locate on site in compliance with Local Permitting Agency requirements and as directed by Owner.

C. Sign shall have two coats of exterior oil base paint.

D. All work shall be performed by an experienced sign painter.

E. Furnish and install supporting structure.

F. Sign shall indicate: Name of Project, Name of Owner, Name of Contractor, Name of Architect, Name of Structural Engineer, Name of Mech/Elec. Engineer and Name of Civil Engineer. (For all School and Municipal Government projects, verify the sign information required with the Owner or Owner's agent prior to painting sign panel.)

2.03 EXTERIOR HANDICAPPED SIGNS AT PARKING AREAS

A. Provide one (1) sign for each handicapped parking space.

B. Sign shall comply with the "Accessibility Codes and Standards" latest edition, State of Florida, for the physically handicapped, and F.T.O. 25 or 26.

C. Sign shall read: "Parking By Disabled Permit Only" depicting National Handicapped Symbol (wheelchair) as detailed. Signs erected after 1 Oct. 1996 must indicate the dollar penalty for illegal use of the space.

D. Size s hall be 1' - 0" wide x 16" high, aluminum.

E. Provide standard painted green steel post set in 6" diameter concrete foundation. Post and concrete foundation shall be by the Contractor.

F. Height to bottom of lowest sign shall be seven feet minimum and nine feet maximum.

G. Lettering style shall be Helvetica Medium.

2.04 TOILET ROOM HANDICAPPED SIGN

A. Provide one (1) sign depicting National Handicapped Symbol (wheelchair) at each toilet room, equipped with facilities for the handicapped. Size shall be as per Signage Legend.

B. Color and Material shall be as per Signage Legend

C. Mounting shall be with non-removable head stainless steel screws at locations detailed in Architectural Signage.

2.05 "INTERIOR" ROOM NAME AND NUMBER SIGNS AND OCCUPANCY CAPACITY

A. Separate signs for room name, room number, or room capacity required. Sizes shall be in accordance with the Signage Legend.

B. Color shall be as per Signage Legend.

C. Material shall be 1/8" thick with raised symbol for identification by blind.

D. Mounting shall be with non-removable head stainless steel screws at locations detailed in Architectural Signage Legend.

2.06 MONUMENT SIGNAGE

A. When depicted on the plans, provide individually mounted letters. Letters as manufactured by the Southwell Company. Letters to be height as scheduled and in style and finish specified on plans. Mounting system as specified on plans.

2.07 REGULATORY SIGNAGE

A. Provide standard graphic and descriptive signage at all elevator lobbies stipulating "In Case of Fire Use Stairs".

B. At all public buildings mount in clear view the no smoking signage as required by Florida Clean Indoor Act of 1985, which became law effective July 1, 2003. Signage must read, "NO SMOKING is permitted in this establishment". Signage letters shall be in color on a white background, Size 14" wide X 10" high. Signs shall be posted adjacent to all required entry and exit doors on the wall or on glass.

PART 3 - EXECUTION

3.01 CLEANING AND PROTECTION

A. At completion of the installation, clean soiled sign surfaces in accordance with the manufacturer's instructions. Protect units from damage until acceptance by the Owner.

B. Mount standard Signs on middle of doors at 48" above the finish floor.

C. Mount A.D.A. and Regulatory Compliant Signs adjacent to door openings, at the latch side, with the center of the sign at 60" above the finish floor. Where there is no wall space to the latch side of the door, signs shall be placed on the nearest adjacent wall.

SIGN LEGEND

SIGN TYPE "A": As manufactured by ASI, 3" high x 8" long or 12" long, square corner 390S Series with molded plastic frames, (interior only), White background with 2" high **in color to be selected.** Letters/Numbers in Upper Case Sans Serif, with raised symbols for blind. Note: Utilize 1 ½" high letters for longer room descriptions to insure that the description will fit on a 12" long sign.

SIGN TYPE "B": As manufactured by ASI, 10" high x 20" long, Sign Etch-2, 3/8" aluminum base metal with etched letters. Radiused corner 390R Series design (exterior only). White background with 5" high paint filled text, **in color to be selected.** Letters/Numbers in Upper Case Sans Serif, with raised symbols for the blind.

SIGN TYPE "C": As manufactured by ASI, 9" square to meet ADA, 390R Series, (interior and exterior rated), with radiused corners, White background with S-5 Unisex Symbols in black, and S-6 Handicapped symbol in standard blue and white colors, per schedule, with raised symbols for blind.

SIGN TYPE "D": As manufactured by ASI, 3" high and 12" long, square corner 390S Series (interior only), Red background with 1" high White letters in Upper Case Sans Serif.

SIGN TYPE "E": As manufactured by ASI, Closed-Circuit TV Door (In Use) Sign: Three (3) SL Series SLO 66 with Sans Serif Regular Lettering. First letter capitalized, remaining letter to be lower case. Install at location determined by the Architect.

SIGN TYPE "F": As manufactured by ASI, 3" high x 12" maximum length, Sign Etch-1, zinc base metal with etched letters. Match square corner 390S Series design (exterior only), **in color to be selected** background with 1 ½" high White Letters/Numbers in Upper Case Sans Serif, with raised symbols for blind.

SIGN TYPE "G": As manufactured by ASI, 9" square to meet ADA, 390R Series, (interior and exterior rated), with radiused corners. White background with S-1 & S-2 Sy6mbols in black, and S-6 Handicapped symbol in standard blue and white colors, per schedule, with raised symbols for blind.

SIGN TYPE "H": As manufactured by ASI, 8" high X 36" long X 1/2" thick, 323BE Series with beveled edges, aluminum frame. **In color to be selected** background with 5" high letters/numbers in Upper Case Sans Serif Bold. **Exterior rated.** Color of letters/numbers shall be **White**.
Where two lines of letters are required, provide a 14-1/2" high X 36" long X 1/2" thick panel.

SIGN TYPE "J": As manufactured by InPro Signscape, or equal, 8" X 8", tactile style, with molded frames with square corners. Color of sign is red background with lettering. Signage to read "In case of Fire use Stairs". Locate signage adjacent to elevator call boxes at 60" to centerline AFF.

SIGN TYPE "K": As manufactured by ASI or equal, 12" w. X 10" h. vinyl peel and stick signage. Adhere to the exterior face of the door glass as scheduled.

SIGN TYPE "L": As manufactured by ASI or equal, 9" square to meet ADA, 390R series, with radius corners. White background with unisex symbols in black and S-6 handicapped symbol in standard blue and white colors, with raised symbols for blind.

LOCATIONS AND DESCRIPTIONS:

PROJECT: **SRHS LOCKER ROOM REMODEL**

Item # 1
Sign type "A" – (2) **EQUIPMENT STORAGE,** (2) **RESTROOM #1,** (2) **RESTROOM #2** Secure to the wall at the latch side of the appropriate door.

Item #2
Sign type "D" – **FIRE EXTINGUISHER** - located above the wall mounted extinguishers as located on the plans.

Item #3
Sign type "F" – (2) **VARSITY LOCKER ROOM #1,** (2) **VARSITY LOCKER ROOM #2, STORAGE, MECHANICAL EQUIPMENT, ELECTRICAL EQUIPMENT, TRAINER, P.E. STORAGE #1, CUSTODIAN.** Secure to the wall at the latch side of the appropriate door.

Item #4
Sign type "K" Building House Numbers. Color to be **BLUE.** Address number is: **To be determined.**

Item #5
Sign type "L" Consists of 2 per count located on the latch side, side by side at (2) **RESTROOM #1,** (2) **RESTROOM #2** accessible unisex restrooms.

SECTION 10520 - PORTABLE FIRE EXTINGUISHERS AND CABINETS

PART I - 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. Definition: "Portable fire extinguishers" includes units which can be hand-carried as opposed to those which are equipped with wheels or to fixed fire extinguishing systems, unless otherwise indicated.

B. Extent of fire extinguishers is indicated on drawings with a **FE** designation.

C. Accessories include: Mounting brackets and recessed cabinets.

NOTE: All Fire Extinguishers for this project are wall hung and not recessed cabinets.

1.03 QUALITY ASSURANCE

A. Provide portable fire extinguishers and accessories by one manufacturer of those specified.

B. Portable Fire Extinguisher Standard: Provide new portable fire extinguishers which comply with applicable UL standard and are labeled by UL. All extinguishers shall be installed and maintained in accordance with NFPA 10, "Portable Fire Extinguishers." Install only fully charged fire extinguishers.

1.04 SUBMITTALS

A. Product Data: Submit manufacturer's technical data, detail drawings, and installation instructions for each portable fire extinguisher and/or recessed cabinet for the project.

B. Schedule: Submit schedule indicating types, quantities, sizes and installation locations for each portable fire extinguisher and/or cabinet for the project.

PART 2 - PRODUCTS

2.01 ACCEPTABLE MANUFACTURER'S

A. Manufacturer: Subject to compliance with requirements, provide extinguishers and cabinets manufactured by one of the following:

J.L. Industries, Inc.
Larsen's Manufacturing Co.
Modern Metal Products by Muckle
Potter-Roemer, Inc.

2.02 MATERIALS - GENERAL

A. Provide the following types of extinguishers in accordance with area/occupancy uses:

1. In General Office Spaces Fire Extinguishers: Multi-purpose dry chemical type (2A-10BC-FE): UL rated 2-A:10:B:C, 5 lb. Nominal capacity, in enameled steel container, for class A, Class B, and Class C fires. Equal to J.L. Industries Cosmic 5E.

2. In Kitchen/Breakroom/Employee Lounge Spaces/ Electrical Rooms: Liquid carbon dioxide, UL rated, 10 lb nominal capacity, in enameled steel container for class B, and Class C fires only. Equal to J.L. Industries Sentinal 10.

3. In Electronic Equipment/Computer Room: Inergen clean agent EPA approved fire extinguishing system complete with metal supply piping, heads, regulators, sensors and steel tanks secured to approved wall brackets. Discharges as an odorless clear gas leaving no residue to clean-up or reclaim. Class A,B,C fires, with system sized to match volume of room to be protected. This system is not considered portable and is specified under a separate section, when utilized in lieu of sprinkler systems in these specialty rooms.

2.03 MOUNTING BRACKETS

A. Provide manufacturer's standard bracket designed to prevent accidental dislodgment of extinguisher, of proper size for type and capacity of extinguisher indicated, in manufacturer's standard plated finish. Extinguishers must be mounted with the bottom of the cylinder at 26 inches above the finished floor if the unit projects more than 4 inches off the face of the wall.

B. Provide a recessed or semi-recessed cabinet, clear anodized aluminum, clear bubble, no letters on the bubble. NOTE: All semi-recessed cabinets must meet ADA guidelines for projections into rooms and hallways. Projections cannot exceed 4 inches. Mount cabinet tubs with case access handles and extinguisher handles at a maximum of 48 inches above finished floor.

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. Where exact location of surface-mounted cabinets and/or bracket-mounted fire extinguishers is not indicated, locate as directed by Architect.

3.02 IDENTIFICATION

A. Identify bracket-mounted extinguishers with a permanently affixed sign with a red background and white letters spelling **"FIRE EXTINGUISHER"** applied to wall surface above extinguisher. Letter size, style and location as scheduled in Section 10440- Specialty Signs.

*****END OF SECTION*****

SECTION - FIRE EXTINGUISHERS AND BLANKETS

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. Definition: "Portable fire extinguishers" includes units which can be hand-carried as opposed to those which are equipped with wheels or to fixed fire extinguishing systems, unless otherwise indicated.
B. Extent of fire extinguishers is indicated on drawings.
C. Accessories include: Mounting brackets and blanket shelves.

1.03 QUALITY ASSURANCE:

A. Provide portable fire extinguishers and accessories by one manufacturer of Contractors choice, unless otherwise acceptable to Architect.

B. Portable Fire Extinguishers Standard: Provide new portable fire extinguishers which comply with applicable UL Standard and are labeled by UL. All extinguishers shall be installed and maintained in accordance with NFPA 10, "Portable Fire Extinguishers." Extinguishers shall remain fully charged and operable at all times and tagged to indicate compliance.

PART 2 - PRODUCTS

2.01 ACCEPTABLE MANUFACTURERS:

A. Manufacturer: Subject to compliance with requirements, provide portable extinguishers and/or cabinets as manufactured by one of the following:

J.L. Industries, Inc.
Larsen's Manufacturing Co.
Modern Metal Products by Muckle
Potter-Roemer, Inc.

2.02 MATERIALS - GENERAL

A. **Class 2-A** extinguishers shall be installed in relocatable classrooms and in general classroom areas where wood and paper are not stored.

B. **Class A** extinguishers of at least **4-A capacity** shall be installed in spaces where

wood and paper are stored, such as woodworking shops and storerooms, and in each portable/relocatable classroom.

C. **Class B** extinguishers of at least **20-B:C capacity** shall be installed in spaces where flammable liquids are stored, such as science labs, auto shops, boiler rooms, duplicating stations, and bulk storage of paints. Alkaline dry chemical extinguishers, such as sodium bicarbonate or potassium bicarbonate, shall be installed within fifteen (15) feet of cooking equipment.

D. **Class C** extinguishers of at least **20-B:C capacity** shall be installed in locations where electrical devices are likely to overheat, such as electronics labs and equipment rooms.

E. **Class ABC** extinguishers may be used for all types of fires classified as **A, B** or **C** except as modified above.

F. Do not lock any extinguisher cabinets, if utilized.

G. **Fire blankets** shall be located in each laboratory and each shop where a fire hazard may exist.

H. **Kitchen:** Liquid carbon dioxide, UL Rated, 10 lb nominal capacity, in enameled steel container for Class B, and Class C fires only. Equal to J.L. Industries Sentinal 10.

PART 3 - EXECUTION

3.01 INSTALLATION

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. Where exact location of surface-mounted cabinets and bracket-mounted fire extinguishers is not indicated, locate as directed by Architect.

3.02 IDENTIFICATION

Identify bracket-mounted extinguishers: Wherever a fire extinguisher is located within a student occupied space, it must be located adjacent to the door, provide a permanently affixed sign, with red background and white letters, reading **"FIRE EXTINGUISHER INSIDE"**. Letter size, style and location as scheduled in Section 10440 - Specialty Signs.

FIRE EXTINGUISHER SCHEDULE:

LOCATED AS PER THE FLOOR PLANS.

*****END OF SECTION*****

SECTION 10800 - TOILET ACCESSORIES

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

Drawings and general provisions of Contract, including General and Supplementary conditions and Division - 1 Specifications sections, apply to work of this Section.

1.02 DESCRIPTION OF WORK

A. Extent and location of each types of toilet accessory is shown on drawings. Provide accessory only if drawn and identified on the Architectural Drawings.

B. Types of toilet accessories required may include the following:
(Refer to plans and interior elevations for locations of specific items)

Paper towel dispensers
Toilet tissue dispensers
Grab bars
Soap dispensers
Shower Rods
Mirrors
Heavy Duty Clothes Hook
Shelf with Mop and Broom Holders
Reversible Folding Shower Seat
Diaper Changing Stations
Wall Mounted Electric Hand Dryers

C. Some type of toilet accessories are included as part of toilet partitions elsewhere in Division 10.

1.03 QUALITY ASSURANCE

A. Inserts and Anchorages: Furnish inserts and anchoring devices which must be set in concrete or built into masonry; provide PT wood backing as required, coordinate delivery with other work to avoid delay.

B. Accessory Locations: Coordinate accessory locations with other work to avoid interference and to assure proper operation and servicing of accessory units.

C. Manufacturer: Provide each type of toilet accessory required as manufactured by one of the following:
1. American Specialties Inc.
2. Bradley Corporation
3. Nutone
4. ASI Group Watrous

SECTION 283111 - DIGITAL, ADDRESSABLE FIRE-ALARM SYSTEM

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. Section Includes:

1. Fire-alarm control unit(s).
2. Manual fire-alarm boxes.
3. System smoke detectors.
4. Heat detectors.
5. Notification appliances.
6. Magnetic door holders.
7. Remote annunciators.
8. Addressable interface device.
9. Digital alarm communicator transmitter.
10. System printer.
11. Voice Alarm Sub-system(s).

1.3 DEFINITIONS

A. LED: Light-emitting diode.

B. NICET: National Institute for Certification in Engineering Technologies.

1.4 SYSTEM DESCRIPTION

A. Noncoded, UL-certified addressable system, with multiplexed signal transmission, dedicated to fire-alarm service only.

1.5 SUBMITTALS

A. General Submittal Requirements:

1. Submittals shall be approved by authorities having jurisdiction prior to submitting them to Architect.
2. Shop Drawings shall be prepared by persons with the following qualifications:

a. Trained and certified by manufacturer in fire-alarm system design.
b. NICET-certified fire-alarm technician, Level III minimum.
c. Licensed or certified by authorities having jurisdiction.

B. Product Data: For each type of product indicated.

C. Shop Drawings: For fire-alarm system. Include plans, elevations, sections, details, and attachments to other work.

1. Comply with recommendations in the "Documentation" Section of the "Fundamentals of Fire Alarm Systems" Chapter in NFPA 72.
2. Include voltage drop calculations for notification appliance circuits.
3. Include battery-size calculations.
4. Include performance parameters and installation details for each detector, verifying that each detector is listed for complete range of air velocity, temperature, and humidity possible when air-handling system is operating.
5. Include plans, sections, and elevations of heating, ventilating, and air-conditioning ducts, drawn to scale and coordinating installation of duct smoke detectors and access to them. Show critical dimensions that relate to placement and support of sampling tubes, detector housing, and remote status and alarm indicators. Locate detectors according to manufacturer's written recommendations.
6. Include voice/alarm signaling-service equipment rack or console layout, grounding schematic, amplifier power calculation, and single-line connection diagram.
7. Include floor plans to indicate final outlet locations showing address of each addressable device. Show size and route of cable and conduits.

D. Delegated-Design Submittal:

1. For fire-alarm system include plans, elevations, sections, details and attachments to other work. Comply with the requirements of paragraph "Shop Drawings."
2. For smoke and heat detectors indicated to comply with performance requirements and design criteria, including analysis data signed and sealed by the qualified professional engineer responsible for their preparation.

    a. Drawings showing the location of each smoke and heat detector, ratings of each, and installation details as needed to comply with listing conditions of the detector.
    b. Design Calculations: Calculate requirements for selecting the spacing and sensitivity of detection, complying with NFPA 72.

E. Qualification Data: For qualified Installer.

F. Field quality-control reports.

G. Operation and Maintenance Data: For fire-alarm systems and components to include in emergency, operation, and maintenance manuals. In addition to items specified in Division 01 Section "Operation and Maintenance Data," include the following:

1. Comply with the "Records" Section of the "Inspection, Testing and Maintenance" Chapter in NFPA 72.
2. Provide "Record of Completion Documents" according to NFPA 72 article "Permanent Records" in the "Records" Section of the "Inspection, Testing and Maintenance" Chapter.
3. Record copy of site-specific software.
4. Provide "Maintenance, Inspection and Testing Records" according to NFPA 72 article of the same name and include the following:

    a. Frequency of testing of installed components.
    b. Frequency of inspection of installed components.
    c. Requirements and recommendations related to results of maintenance.
    d. Manufacturer's user training manuals.

5. Manufacturer's required maintenance related to system warranty requirements.

6. Abbreviated operating instructions for mounting at fire-alarm control unit.
7. Copy of NFPA 25.

H. Software and Firmware Operational Documentation:

1. Software operating and upgrade manuals.
2. Program Software Backup: On magnetic media or compact disk, complete with data files.
3. Device address list.
4. Printout of software application and graphic screens.

1.6 QUALITY ASSURANCE

A. Installer Qualifications: Personnel shall be trained and certified by manufacturer for installation of units required for this Project.

B. Installer Qualifications: Installation shall be by personnel certified by NICET as fire-alarm Level II technician.

C. Source Limitations for Fire-Alarm System and Components: Obtain fire-alarm system from single source from single manufacturer. Components shall be compatible with, and operate as, an extension of existing system.

D. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.

E. NFPA Certification: Obtain certification according to NFPA 72 by an NRTL.

1.7 SOFTWARE SERVICE AGREEMENT

A. Comply with UL 864.

B. Technical Support: Beginning with Substantial Completion, provide software support for three years.

C. Upgrade Service: Update software to latest version at Project completion. Install and program software upgrades that become available within three years from date of Substantial Completion. Upgrading software shall include operating system. Upgrade shall include new or revised licenses for use of software.

1. Provide 30 days' notice to Owner to allow scheduling and access to system and to allow Owner to upgrade computer equipment if necessary.

1.8 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. Lamps for Strobe Units: Quantity equal to 10 percent of amount installed, but no fewer than 1 unit.
2. Smoke Detectors, Fire Detectors: Quantity equal to 10 percent of amount of each type installed, but no fewer than 1 unit of each type.
3. Detector Bases: Quantity equal to 2 percent of amount of each type installed, but no fewer than 1 unit of each type.

4. Keys and Tools: One extra set for access to locked and tamperproofed components.
5. Audible and Visual Notification Appliances: One of each type installed.
6. Fuses: Two of each type installed in the system in a fuse cabinet adjacent to main fire alarm control panel.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Basis-of-Design Product: Subject to compliance with requirements, provide EST, a United Technologies Company, EST3 networked system or comparable product by one of the following:

1. Edwards.

2.2 SYSTEMS OPERATIONAL DESCRIPTION

A. Fire-alarm signal initiation shall be by one or more of the following devices and systems:

1. Manual stations.
2. Heat detectors.
3. Smoke detectors.
4. Duct smoke detectors.
5. Verified automatic alarm operation of smoke detectors.
6. Automatic sprinkler system water flow.
7. Heat detectors in elevator shaft and pit.
8. Fire-extinguishing system operation.
9. Fire standpipe system.

B. Fire-alarm signal shall initiate the following actions:

1. Continuously operate alarm notification appliances.
2. Identify alarm at fire-alarm control unit and remote annunciators.
3. Transmit an alarm signal to the remote alarm receiving station.
4. Unlock electric door locks in designated egress paths.
5. Release fire and smoke doors held open by magnetic door holders.
6. Activate voice/alarm communication system.
7. Switch heating, ventilating, and air-conditioning equipment controls to fire-alarm mode.
8. Close smoke dampers in air ducts of designated air-conditioning duct systems.
9. Recall elevators to primary or alternate recall floors.
10. Activate emergency shutoffs for gas and fuel supplies.
11. Record events in the system memory.
12. Record events by the system printer.

C. Supervisory signal initiation shall be by one or more of the following devices and actions:

1. Valve supervisory switch.
2. Elevator shunt-trip supervision.
3. Duct smoke detector operation.

D. System trouble signal initiation shall be by one or more of the following devices and actions:

1. Open circuits, shorts, and grounds in designated circuits.

2. Opening, tampering with, or removing alarm-initiating and supervisory signal-initiating devices.
3. Loss of primary power at fire-alarm control unit.
4. Ground or a single break in fire-alarm control unit internal circuits.
5. Abnormal ac voltage at fire-alarm control unit.
6. Break in standby battery circuitry.
7. Failure of battery charging.
8. Abnormal position of any switch at fire-alarm control unit or annunciator.
9. Fire-pump power failure, including a dead-phase or phase-reversal condition.

E. System Trouble and Supervisory Signal Actions: Initiate notification appliance and annunciate at fire-alarm control unit and remote annunciators. Record the event on system printer.

2.3 FIRE-ALARM CONTROL UNIT

A. General Requirements for Fire-Alarm Control Unit:

1. Field-programmable, microprocessor-based, modular, power-limited design with electronic modules, complying with UL 864 and listed and labeled by an NRTL.

    a. System software and programs shall be held in flash electrically erasable programmable read-only memory (EEPROM), retaining the information through failure of primary and secondary power supplies.
    b. Include a real-time clock for time annotation of events on the event recorder and printer.

2. Addressable initiation devices that communicate device identity and status.

    a. Smoke sensors shall additionally communicate sensitivity setting and allow for adjustment of sensitivity at fire-alarm control unit.
    b. Temperature sensors shall additionally test for and communicate the sensitivity range of the device.

3. Addressable control circuits for operation of mechanical equipment.

B. Alphanumeric Display and System Controls: Arranged for interface between human operator at fire-alarm control unit and addressable system components including annunciation and supervision. Display alarm, supervisory, and component status messages and the programming and control menu.

1. Annunciator and Display: Liquid-crystal type, 640 minimum characters. .
2. Keyboard: Arranged to permit entry and execution of programming, display, and control commands and to indicate control commands to be entered into the system for control of smoke-detector sensitivity and other parameters.

C. Circuits:

1. Initiating Device, Notification Appliance, and Signaling Line Circuits: NFPA 72, Class B.

    a. Initiating Device Circuits: Style B.
    b. Notification Appliance Circuits: Style Y.
    c. Signaling Line Circuits: Style 4.
    d. Install no more than 50 addressable devices on each signaling line circuit.

2. Serial Interfaces: Four RS-232 ports for printers and CRTs.
3. EIA 485 ports: Four, minimum, for communication with other system components.
4. Interface module(s) for Dual fiber-optic links between buildings.

D. Smoke-Alarm Verification:

1. Initiate audible and visible indication of an "alarm-verification" signal at fire-alarm control unit.
2. Activate an NRTL-listed and -approved "alarm-verification" sequence at fire-alarm control unit and detector.
3. Record events by the system printer.
4. Sound general alarm if the alarm is verified.
5. Cancel fire-alarm control unit indication and system reset if the alarm is not verified.

E. Notification Appliance Circuit: Operation shall sound in a ANSI standard temporal pattern.

F. Elevator Recall:

1. Smoke detectors at the following locations shall initiate automatic elevator recall. Alarm-initiating devices, except those listed, shall not start elevator recall.

    a. Elevator lobby detectors except the lobby detector on the designated floor.
    b. Smoke detector in elevator machine room.
    c. Smoke detectors in elevator hoistway.

2. Elevator lobby detectors located on the designated recall floors shall be programmed to move the cars to the alternate recall floor.
3. Water-flow alarm connected to sprinkler in an elevator shaft and elevator machine room shall shut down elevators associated with the location without time delay.

    a. Water-flow switch associated with the sprinkler in the elevator pit may have a delay to allow elevators to move to the designated floor.

G. Door Controls: Door hold-open devices that are controlled by smoke detectors at doors in smoke barrier walls shall be connected to fire-alarm system.

H. Remote Smoke-Detector Sensitivity Adjustment: Controls shall select specific addressable smoke detectors for adjustment, display their current status and sensitivity settings, and change those settings. Allow controls to be used to program repetitive, time-scheduled, and automated changes in sensitivity of specific detector groups. Record sensitivity adjustments and sensitivity-adjustment schedule changes in system memory, and print out the final adjusted values on system printer.

I. Transmission to Remote Alarm Receiving Station: Automatically transmit alarm, supervisory, and trouble signals to a remote alarm station.

J. Voice/Alarm Signaling Service: Central emergency communication system with redundant microphones, preamplifiers, amplifiers, and tone generators provided as a special module that is part of fire-alarm control unit.

1. Indicated number of alarm channels for automatic, simultaneous transmission of different announcements to different zones or for manual transmission of announcements by use of the central-control microphone. Amplifiers shall comply with UL 1711 and be listed by an NRTL.

    a. Allow the application of and evacuation signal to indicated number of zones and, at same time, allow voice paging to the other zones selectively or in any combination.
    b. Programmable tone and message sequence selection.
    c. Standard digitally recorded messages for "Evacuation" and "All Clear."
    d. Generate tones to be sequenced with audio messages of type recommended by NFPA 72 and that are compatible with tone patterns of notification appliance circuits of fire-alarm control unit.

2. Status Annunciator: Indicate the status of various voice/alarm speaker zones and the status of firefighters' two-way telephone communication zones.
3. Preamplifiers, amplifiers, and tone generators shall automatically transfer to backup units, on primary equipment failure.

K. Printout of Events: On receipt of signal, print alarm, supervisory, and trouble events. Identify zone, device, and function. Include type of signal (alarm, supervisory, or trouble) and date and time of occurrence. Differentiate alarm signals from all other printed indications. Also print system reset event, including same information for device, location, date, and time. Commands initiate the printing of a list of existing alarm, supervisory, and trouble conditions in the system and a historical log of events.

L. Primary Power: 24-V dc obtained from 120-V ac service and a power-supply module. Initiating devices, notification appliances, signaling lines, trouble signals, supervisory and digital alarm communicator transmitters shall be powered by 24-V dc source.

1. Alarm current draw of entire fire-alarm system shall not exceed 80 percent of the power-supply module rating.

M. Secondary Power: 24-V dc supply system with batteries, automatic battery charger, and automatic transfer switch.

1. Batteries: Sealed, valve-regulated, recombinant lead acid.

N. Instructions: Computer printout or typewritten instruction card mounted behind a plastic or glass cover in a stainless-steel or aluminum frame. Include interpretation and describe appropriate response for displays and signals. Briefly describe the functional operation of the system under normal, alarm, and trouble conditions.

2.4 MANUAL FIRE-ALARM BOXES

A. General Requirements for Manual Fire-Alarm Boxes: Comply with UL 38. Boxes shall be finished in red with molded, raised-letter operating instructions in contrasting color; shall show visible indication of operation; and shall be mounted on recessed outlet box. If indicated as surface mounted, provide manufacturer's surface back box.

1. Double-action mechanism requiring two actions to initiate an alarm, pull-lever type; with integral addressable module arranged to communicate manual-station status (normal, alarm, or trouble) to fire-alarm control unit.
2. Station Reset: Key- or wrench-operated switch.
3. Indoor Protective Shield: Factory-fabricated clear plastic enclosure hinged at the top to permit lifting for access to initiate an alarm. Lifting the cover actuates an integral battery-powered audible horn intended to discourage false-alarm operation.
4. Weatherproof Protective Shield: Factory-fabricated clear plastic enclosure hinged at the top to permit lifting for access to initiate an alarm.

2.5 SYSTEM SMOKE DETECTORS

A. General Requirements for System Smoke Detectors:

1. Comply with UL 268; operating at 24-V dc, nominal.
2. Detectors shall be two-wire type.
3. Integral Addressable Module: Arranged to communicate detector status (normal, alarm, or trouble) to fire-alarm control unit.

4. Base Mounting: Detector and associated electronic components shall be mounted in a twist-lock module that connects to a fixed base. Provide terminals in the fixed base for connection to building wiring.
5. Self-Restoring: Detectors do not require resetting or readjustment after actuation to restore them to normal operation.
6. Integral Visual-Indicating Light: LED type indicating detector has operated and power-on status.
7. Remote Control: Unless otherwise indicated, detectors shall be analog-addressable type, individually monitored at fire-alarm control unit for calibration, sensitivity, and alarm condition and individually adjustable for sensitivity by fire-alarm control unit.

    a. Rate-of-rise temperature characteristic shall be selectable at fire-alarm control unit for 15 or 20 deg F per minute.
    b. Fixed-temperature sensing shall be independent of rate-of-rise sensing and shall be settable at fire-alarm control unit to operate at 135 or 155 deg F.
    c. Provide multiple levels of detection sensitivity for each sensor.

B. Photoelectric Smoke Detectors:

1. Detector address shall be accessible from fire-alarm control unit and shall be able to identify the detector's location within the system and its sensitivity setting.
2. An operator at fire-alarm control unit, having the designated access level, shall be able to manually access the following for each detector:

    a. Primary status.
    b. Device type.
    c. Present average value.
    d. Present sensitivity selected.
    e. Sensor range (normal, dirty, etc.).

C. Ionization Smoke Detector:

1. Detector address shall be accessible from fire-alarm control unit and shall be able to identify the detector's location within the system and its sensitivity setting.
2. An operator at fire-alarm control unit, having the designated access level, shall be able to manually access the following for each detector:

    a. Primary status.
    b. Device type.
    c. Present average value.
    d. Present sensitivity selected.
    e. Sensor range (normal, dirty, etc.).

D. Duct Smoke Detectors: Photoelectric type complying with UL 268A.

1. Detector address shall be accessible from fire-alarm control unit and shall be able to identify the detector's location within the system and its sensitivity setting.
2. An operator at fire-alarm control unit, having the designated access level, shall be able to manually access the following for each detector:

    a. Primary status.
    b. Device type.
    c. Present average value.
    d. Present sensitivity selected.
    e. Sensor range (normal, dirty, etc.).

3. Weatherproof Duct Housing Enclosure: NEMA 250, Type 4X; NRTL listed for use with the supplied detector.
4. Each sensor shall have multiple levels of detection sensitivity.
5. Sampling Tubes: Design and dimensions as recommended by manufacturer for specific duct size, air velocity, and installation conditions where applied.
6. Relay Fan Shutdown: Rated to interrupt fan motor-control circuit.

2.6 HEAT DETECTORS

A. General Requirements for Heat Detectors: Comply with UL 521.

B. Heat Detector, Combination Type: Actuated by either a fixed temperature of 135 deg F or a rate of rise that exceeds 15 deg F per minute unless otherwise indicated.

1. Mounting: Twist-lock base interchangeable with smoke-detector bases.
2. Integral Addressable Module: Arranged to communicate detector status (normal, alarm, or trouble) to fire-alarm control unit.

C. Heat Detector, Fixed-Temperature Type: Actuated by temperature that exceeds a fixed temperature of 190 deg F, unless otherwise indicated.

1. Mounting: Twist-lock base interchangeable with smoke-detector bases.
2. Integral Addressable Module: Arranged to communicate detector status (normal, alarm, or trouble) to fire-alarm control unit.

2.7 NOTIFICATION APPLIANCES

A. Manufacturers:

1. Basis-of-Design Product: Subject to compliance with requirements, provide Gentex notification appliances or comparable product by one of the following:
   a. Edwards.

B. General Requirements for Notification Appliances: Individually addressed, connected to a signaling line circuit, equipped for mounting as indicated and with screw terminals for system connections.

C. General Requirements for Notification Appliances: Connected to notification appliance signal circuits, zoned as indicated, equipped for mounting as indicated and with screw terminals for system connections.

1. Combination Devices: Factory-integrated audible and visible devices in a single-mounting assembly, equipped for mounting as indicated and with screw terminals for system connections.

D. Horns: Electric-vibrating-polarized type, 24-V dc; with provision for housing the operating mechanism behind a flush grille. Comply with UL 464. Horns shall produce a sound-pressure level of 90 dBA, measured 10 feet from the horn, using the coded signal prescribed in UL 464 test protocol.

1. Edwards

E. Visible Notification Appliances: Xenon strobe lights comply with UL 1971, with clear or nominal white polycarbonate lens mounted on an aluminum faceplate. The word "FIRE" is engraved in minimum 1-inch- high letters on the lens.

1. Rated Light Output:

a. 15/30/75/110 cd, selectable in the field.

2. Mounting: Wall mounted unless otherwise indicated.
3. For units with guards to prevent physical damage, light output ratings shall be determined with guards in place.
4. Flashing shall be in a temporal pattern, synchronized with other units.
5. Strobe Leads: Factory connected to screw terminals.
6. Mounting Faceplate: Factory finished, white.
7. Catalog Number: GES3 series.

F. Voice/Tone Notification Appliances:

1. Appliances shall comply with UL 1480 and shall be listed and labeled by an NRTL.
2. High-Range Units: Rated 2 to 15 W.
3. Low-Range Units: Rated 1 to 2 W.
4. Mounting: Flush.
5. Matching Transformers: Tap range matched to acoustical environment of speaker location.
6. Manufacturer: Wheellock

a. Low-range units: ET70 series.
b. High range units: ET90 series

G. Voice Speaker Clusters:

1. Appliances shall comply with UL 1480 and shall be listed and labeled by an NRTL.
2. Speaker Units: Rated 15 to 30 W. per unit
3. Mounting: Pendant
4. Matching Transformers: Tap range matched to acoustical environment of speaker location.
5. Strobes: 177 cd
6. Manufacturer: Wheellock Series STH

2.8 MAGNETIC DOOR HOLDERS

A. Description: Units are equipped for wall or floor mounting as indicated and are complete with matching doorplate.

1. Electromagnet: Requires no more than 3 W to develop 25-lbf holding force.
2. Wall-Mounted Units: Flush mounted unless otherwise indicated.
3. Rating: 24-V ac or dc.
4. Rating: 120-V ac.

B. Material and Finish: Match door hardware.

2.9 REMOTE ANNUNCIATOR

A. Description: Annunciator functions shall match those of fire-alarm control unit for alarm, supervisory, and trouble indications. Manual switching functions shall match those of fire-alarm control unit, including acknowledging, silencing, resetting, and testing.

1. Mounting: Flush cabinet, NEMA 250, Type 1.

B. Display Type and Functional Performance: LCD Alphanumeric display with operator keyboard and LED status indicators. Provide controls to acknowledge, silence, reset, and test functions for alarm, supervisory, and trouble signals.

2.10 ADDRESSABLE INTERFACE DEVICE

A. Description: Microelectronic monitor module, NRTL listed for use in providing a system address for alarm-initiating devices for wired applications with normally open contacts.

B. Integral Relay: Capable of providing a direct signal to elevator controller to initiate elevator recall or to circuit-breaker shunt trip for power shutdown or to shutdown AHUs and other fans .

2.11 DIGITAL ALARM COMMUNICATOR TRANSMITTER

A. Digital alarm communicator transmitter shall be acceptable to the remote central station and shall comply with UL 632 and be listed and labeled by an NRTL.

B. Functional Performance: Unit shall receive an alarm, supervisory, or trouble signal from fire-alarm control unit and automatically capture two telephone line(s) and dial a preset number for a remote central station. When contact is made with central station(s), signals shall be transmitted. If service on either line is interrupted for longer than 45 seconds, transmitter shall initiate a local trouble signal and transmit the signal indicating loss of telephone line to the remote alarm receiving station over the remaining line. Transmitter shall automatically report telephone service restoration to the central station. If service is lost on both telephone lines, transmitter shall initiate the local trouble signal.

C. Local functions and display at the digital alarm communicator transmitter shall include the following:

1. Verification that both telephone lines are available.
2. Programming device.
3. LED display.
4. Manual test report function and manual transmission clear indication.
5. Communications failure with the central station or fire-alarm control unit.

D. Digital data transmission shall include the following:

1. Address of the alarm-initiating device.
2. Address of the supervisory signal.
3. Address of the trouble-initiating device.
4. Loss of ac supply or loss of power.
5. Low battery.
6. Abnormal test signal.
7. Communication bus failure.

E. Secondary Power: Integral rechargeable battery and automatic charger.

F. Self-Test: Conducted automatically every 24 hours with report transmitted to central station.

2.12 SYSTEM PRINTER

A. Printer shall be listed and labeled by an NRTL as an integral part of fire-alarm system.

2.13 DEVICE GUARDS

A. Description: Welded wire mesh of size and shape for the manual station, smoke detector, gong, or other device requiring protection.

1. Factory fabricated and furnished by manufacturer of device.
2. Finish: Paint of color to match the protected device.

PART 3 - EXECUTION

3.1 EQUIPMENT INSTALLATION

A. Comply with NFPA 72 for installation of fire-alarm equipment.

B. Wiring Methods:

1. Enclose all wiring in metallic raceway within buildings and structures.
2. Refer to Section RACEWAY AND BOXES FOR ELECTRICAL SYSTEMS for type of raceway required in different spaces and conditions.
3. PVC80 conduit may be used for exterior underground raceway. Minimum depth-of-bury is 36."
4. Minimum raceway size is 3/4" trade size.
5. Line voltage conductors shall be solid copper conductors with 600 V-rated THWN insulation. Provide #10 gauge minimum, with adjustments for long runs. Preferred initiation loop conductors are West Penn.
6. Signal circuits shall be #14 AWG THWN 19 strand copper.
7. Annunciator Circuits shall be #16 AWG THWN 19 strand copper.
8. Wire AWG sizes shall be adjusted to a larger size as required by the manufacturers' voltage drop recommendations and the load served.
9. Color code all conductors per BCSB standard:

Color Code:			Positive	Negative
Audio/visual		#14 AWG (THWN)	+blue	-yellow
Relay circuit		#14 AWG (THWN)	+purple	-gray (NC)
Door holders		#14 AWG (THWN)	+brown	-orange
Gas shutoff		#14 AWG (THWN)	+blue	-yellow
24 – 28 VDC		#14 AWG (THWN)	+red	-black
Automatic addressable)	(non	#14 AWG (THWN)	+yellow	-brown
Manual addressable)	(non	#14 AWG (THWN)	+blue	-purple

10. All conductors shall be unspliced between devices. Make connections directly to device terminals.
11. Tee tapping of circuits is prohibited.

C. Equipment Mounting: Install fire-alarm control unit on finished floor with tops of cabinets not more than 72 inches above the finished floor unless otherwise noted.

1. Comply with NFPA 72, "Smoke-Sensing Fire Detectors" Section in the "Initiating Devices" Chapter, for smoke-detector spacing.
2. Comply with NFPA 72, "Heat-Sensing Fire Detectors" Section in the "Initiating Devices" Chapter, for heat-detector spacing.
3. Smooth ceiling spacing shall not exceed 30 feet.
4. Spacing of detectors for irregular areas, for irregular ceiling construction, and for high ceiling areas shall be determined according to Appendix A in NFPA 72.
5. HVAC: Locate detectors not closer than 3 feet from air-supply diffuser or return-air opening.
6. Lighting Fixtures: Locate detectors not closer than 12 inches from any part of a lighting fixture.

D. Duct Smoke Detectors: Comply with NFPA 72 and NFPA 90A. Install sampling tubes so they extend the full width of duct.

E. Heat Detectors in Elevator Shafts: Coordinate temperature rating and location with sprinkler rating and location.

F. Remote Status and Alarm Indicators: Install near each smoke detector and each sprinkler water-flow switch and valve-tamper switch that is not readily visible from normal viewing position.

G. Audible Alarm-Indicating Devices: Install not less than 6 inches below the ceiling. Install horns on flush-mounted back boxes with the device-operating mechanism concealed behind a grille.

H. Visible Alarm-Indicating Devices: Install adjacent to each alarm horn and at least 6 inches below the ceiling.

I. Device Location-Indicating Lights: Locate in public space near the device they monitor.

J. Fire-Alarm Control Unit: Surface mounted, with tops of cabinets not more than 72 inches above the finished floor.

K. Annunciator: Install with top of panel not more than 72 inches above the finished floor.

3.2 CONNECTIONS

A. For fire-protection systems related to doors in fire-rated walls and partitions and to doors in smoke partitions, comply with requirements in Division 08 Section "Door Hardware." Connect hardware and devices to fire-alarm system.

1. Verify that hardware and devices are NRTL listed for use with fire-alarm system in this Section before making connections.

B. Make addressable connections with a supervised interface device to the following devices and systems. Install the interface device less than 3 feet from the device controlled. Make an addressable confirmation connection when such feedback is available at the device or system being controlled.

1. Smoke dampers in air ducts of designated air-conditioning duct systems.
2. Alarm-initiating connection to elevator recall system and components.
3. Alarm-initiating connection to activate emergency shutoffs for gas and fuel supplies.
4. Supervisory connections at valve supervisory switches.
5. Supervisory connections at elevator shunt trip breaker.
6. Supervisory connections at fire-pump power failure including a dead-phase or phase-reversal condition.
7. Supervisory connections at fire-pump motor control panel.

3.3 IDENTIFICATION

A. Identify system components, wiring, cabling, and terminals. Comply with requirements for identification specified in Division 26 Section "Identification for Electrical Systems."

B. Install framed instructions in a location visible from fire-alarm control unit.

3.4 GROUNDING

A. Ground fire-alarm control unit and associated circuits; comply with IEEE 1100. Install a ground wire from main service ground to fire-alarm control unit.

3.5 FIELD QUALITY CONTROL

A. Field tests shall be witnessed by authorities having jurisdiction.

B. Manufacturer's Field Service: Engage a factory-authorized service representative to inspect, test, and adjust components, assemblies, and equipment installations, including connections.

C. Perform tests and inspections.

1. Manufacturer's Field Service: Engage a factory-authorized service representative to inspect components, assemblies, and equipment installations, including connections, and to assist in testing.

D. Tests and Inspections:

1. Visual Inspection: Conduct visual inspection prior to testing.

a. Inspection shall be based on completed Record Drawings and system documentation that is required by NFPA 72 in its "Completion Documents, Preparation" Table in the "Documentation" Section of the "Fundamentals of Fire Alarm Systems" Chapter.

2. System Testing: Comply with "Test Methods" Table in the "Testing" Section of the "Inspection, Testing and Maintenance" Chapter in NFPA 72.
3. Test audible appliances for the public operating mode according to manufacturer's written instructions. Perform the test using a portable sound-level meter complying with Type 2 requirements in ANSI S1.4.
4. Factory-authorized service representative shall prepare the "Fire Alarm System Record of Completion" in the "Documentation" Section of the "Fundamentals of Fire Alarm Systems" Chapter in NFPA 72 and the "Inspection and Testing Form" in the "Records" Section of the "Inspection, Testing and Maintenance" Chapter in NFPA 72.

E. Reacceptance Testing: Perform reacceptance testing to verify the proper operation of added or replaced devices and appliances.

F. Fire-alarm system will be considered defective if it does not pass tests and inspections.

G. Prepare test and inspection reports.

H. Maintenance Test and Inspection: Perform tests and inspections listed for weekly, monthly, quarterly, and semiannual periods. Use forms developed for initial tests and inspections.

I. Annual Test and Inspection: One year after date of Substantial Completion, test fire-alarm system complying with visual and testing inspection requirements in NFPA 72. Use forms developed for initial tests and inspections.

3.6 DEMONSTRATION

A. Engage a factory-authorized service representative to train Owner's maintenance personnel to adjust, operate, and maintain fire-alarm system.

END OF SECTION 283111