School District of Indian River County

Purchasing Department
Attn: Jeff Carver, Director
6055 62nd Avenue
Vero Beach, FL 32967
Telephone 772-564-5050 Fax 772-564-5048

Date: March 15, 2017

To: All Participants

From: Jeff Carver, CPPO, Director of Purchasing

Re: SDIRC 12-0-2017 Addendum 1

ADDENDUM 1

The School District of Indian River County has issued Addendum 1 to change the expected contract completion date to September 29, 2017 and provide the attached technical specifications.

_____

Signature of Respondent Date

***Failure to include this signed addendum with your submittal may result in disqualification.**

Project:

Sebastian River High School
Music Building Addition/Remodel
& Gate Replacement

Located at:

9001 Shark Blvd
Sebastian, FL 32958

PROJECT MANUAL / TECHNICAL SPECIFICATIONS

Prepared By:

Edlund, Dritenbas, Binkley Architects & Associates, P.A.
65 Royal Palm Pointe, Suite-D
Vero Beach, Florida 32960
AR #AAC000886

Architect's Commission Number
#090116VB

OWNER:

Indian River County School District
6055 62nd Ave
Vero Beach, FL 32967

DATE: 18 January 2017

TABLE OF CONTENTS

SECTION & DESCRIPTION

DIVISION 5, METALS

Section 05030 – Powdered Coating
Section 05120 – Structural Steel
Section 05210 – Steel Joists
Section 05300 – Metal Decking
Section 05400 – Lightgauge Metal Framing
Section 05500 – Miscellaneous Metals

DIVISION 6, CARPENTRY

Section 06100 – Rough Carpentry

DIVISION 7, THERMAL & MOISTURE PROTECTION

Section 07190 – Vapor Barrier
Section 07200 – Insulation
Section 07220 – Lightweight Concrete on Insulperm Board
Section 07320 – Concrete Roofing Tiles – Mechanically Fastened
Section 07516 – Fully Adhered Single Ply Roofing
Section 07600 – Flashing & Sheet Metal
Section 07605 – Insulated Standing Seam Roof System
Section 07710 – Industrial Series Aluminum Gutters and Downspouts
Section 07715 – Drip Flashings
Section 07900 – Joint Sealants and Adhesives

DIVISION 8, DOORS, WINDOWS AND GLASS

Section 08100 – Hollow Metal Doors & Frames
Section 08200 – Wood Doors
Section 08400 – Entrance Storefront Doors
Section 08410 – Flush Glazed Storefront Windows
Section 08700 – Finish Hardware
Section 08710 – Finish Hardware Schedule

DIVISION 9, FINISHES

Section 09100 – Lathing and Stucco
Section 09250 – Gypsum Drywall
Section 09510 – Lay in Panel Ceilings
Section 09730 – Seamless Epoxy Flooring
Section 09900 – Painting

DIVISION 10, SPECIALTIES

Section 10260 – Corner Guards
Section 10440 – Specialty Signs
Section 10520 – Portable Fire Extinguishers

DIVISION 11, EQUIPMENT

This section not used.

DIVISION 12, FURNISHINGS

This section not used.

DIVISION 13, SPECIAL CONSTRUCTION

This section not used.

DIVISION 14, CONVEYING SYSTEMS

This section not used.

DIVISION 15, MECHANICAL

Specifications on drawings.

DIVISION 16, ELECTRICAL

Specifications on drawings.

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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 02110 - SITE CLEARING AND GRUBBING

1.01 SCOPE

A. The Contractor shall furnish all labor, materials and equipment, and all operations required to clear and grub the site as shown on the Plans and specified herein.

2.01 GENERAL

A. Clearing and grubbing shall consist of the complete removal and disposal of all trees, brush, logs, stumps, roots, weeds, rubbish, rocks, structures designated to be removed, concrete and other deleterious material and obstructions resting upon or protruding through the surface of the ground. Stumps, roots 3" and over and similar obstructions shall be removed to a minimum depth of 2 feet below the existing ground. All structural items shall be excavated to full depth, completely removed, and the excavation backfilled per these specifications.

B. The Contractor shall clear and grub the areas described below:
   1. Area of development, easements, swales, and other areas where construction is to take place only with specific approval of The Engineer of Record as to the exact areas to be cleared.
   2. Areas below floor slabs and walkways.

C. All usable topsoil shall be stripped and stockpiled, to be used in the final grading of areas to receive sod and landscaping. Left over stockpiled fill shall become the property of the Contractor and the Contractor will be responsible for its removal.

D. The Contractor shall take care not to damage any existing trees beyond the limits of construction and shall replace any and all landscaping damaged by him, at no cost to the Owner.

E. The Contractor shall be responsible for locating all underground lines and/or utilities and he shall take the necessary precautions/care not to damage them. The Contractor shall repair any and all damage to underground lines, at his cost, if same were located for him prior to the beginning of construction.

3.01 DISPOSAL

A. BURNING PERMITTED ON SITE
   1. When permitted by local governing authorities, trees, stumps, brush, weeds, and similar natural materials may be burned on site. The Contractor shall dispose of all unburned residue off site, and if required by the Engineer, spread the ash. Material which will not burn or will not burn without air pollution, such as asphalt and tires, shall be hauled off site for disposal in an approved manner.

B. OFF SITE DISPOSAL

1. When on site burning is not permitted, all material shall be hauled off site by the Contractor for disposal in an approved manner.

C. The Contractor shall be responsible for obtaining and complying with the provisions of all necessary permits. All fees shall be paid by the Contractor.

D. THIS PROJECT: **No material shall be burned on site.**

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

SECTION 02120 - TRENCH SAFETY SYSTEM

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

A. General Conditions and Supplementary Conditions apply to this Section.

1.02 WORK INCLUDED

A. Furnish all labor and materials for installation and maintenance of a trench safety system.

B. Trench excavations in materials other than solid rock, greater than (5) five feet in depth, or where directed by the Owner's Representative, the Contractor shall provide a trench safety system.

1.03 RELATED SECTIONS

A. Section 02200 - Earthwork.

B. Section 02660 - Water Distribution.

C. Section 02700 - Sewerage and Drainage.

1.04 SUBMITTALS

A. The Contractor shall submit to the Owner's Representative prior to construction, a "Trench Safety Plan" for protecting employees and the public exposed to the danger of moving ground for all excavations. The plan shall describe which method of protection or type of system will be used and where it will be used for each condition or situation encountered on the job. The plan shall comply with applicable OSHA standards.

B. For any trench shoring system to be used other than shown in Table P-2 from the OSHA standard for excavating operations, the Contractor must provide certification by a Registered Professional Engineer that the system proposed by the Contractor provides protection "equal to" or "greater than" the protection provided by the Trench Shoring Systems shown in OSHA Table P-2.

C. The Contractor ***shall provide a bid item on his schedule of values*** stating the unit cost of trench safety. The cost of the trench safety system shall be included in the Contractor's base bid, and shall be at no additional cost to the Owner.

1.05 QUALITY ASSURANCE

A. The trench safety system shall meet the appropriate requirements established in the Occupational Safety and Health Administration (OSHA) Standards, 29 CFR, Part 1926, Subpart P- Excavations, Trenching, and Shoring.

1.06 PROJECT CONDITIONS

A. Coordination: Coordinate this work with the work of other Sections to avoid any delay or interference with other work.

PART 2 - PRODUCTS

2.01 MATERIALS

A. Timber: Timber for trench sheeting shall be hardwood, a minimum of two inches in thickness, solid and sound, and free from weakening defects such as loose knots and splits.

B. Steel Sheet Piling: Steel sheet piling shall conform to one of the following specifications: ASTM A328, ASTM A572 Grade 50, or ASTM A690.

C. Stringers and Cross Bracing: Steel for stringers and cross bracing shall conform to ASTM A588.

D. Portable Trench Boxes: Portable trench boxes shall be constructed of steel conforming to ASTM Specification A36. Connecting bolts used shall conform to ASTM A307. All welds and welding shall conform to AWS D1.1.

PART 3 - EXECUTION

3.01 EXAMINATION

A. Examine areas in which work is to be performed. Report in writing to Owner's Representative all prevailing conditions that will adversely affect satisfactory execution of the work. Do not proceed with work until unsatisfactory conditions have been corrected.

B. Starting work constitutes acceptance of the existing conditions and this Contractor shall then, at his expense, be responsible for correcting all unsatisfactory and defective work encountered.

3.02 GENERAL

A. The trench safety system shall be constructed, installed, and maintained in

accordance with the plans and/or to the design prepared by the Contractor's Registered Professional Engineer, to prevent death or injury to personnel or damage to structures in or near these trench excavations. Materials excavated from the trench shall be stored no closer to the edge of the trench than one-half the depth of the trench.

3.03 INSTALLATION

A. Timber sheeting shall be installed in accordance with OSHA requirements. The timber sheeting shall be driven to the depth of the trench bottom. Cross braces shall be placed in the true horizontal position, spaced vertically and secured to prevent sliding, falling, or kickouts.

B. Steel sheet piling of equal or greater strength may be substituted for timber trench shoring. The Contractor shall provide certification that the steel sheet piling substituted provides equal or greater protection than the timber shoring. The certification for the sheet piling shall be provided by a Registered Professional Engineer. The steel sheet piling shall be driven to the minimum depth below the trench bottom as recommended by the Registered Professional Engineer providing the design. Place cross braces in true horizontal position, spaced vertically and secure to prevent sliding, falling or kickouts.

C. Portable trench boxes may be substituted for the timber trench shoring. The trench box shall be designed to provide equal or greater protection than the timber trench shoring. Certification of the design shall be provided by the Contractor prior to its use on the project. In cases where the top of the portable trench box will be below the top of the trench, the trench must be sloped to the approximate angle of repose for the soil conditions existing on the project. In areas where the sloped trench will affect the integrity of existing structures, the Contractor shall take measures necessary to protect the structures prior to sloping the trench.

D. When trench jacks are used for cross bracing and or stringers, the Contractor shall provide certification by the Manufacturer, that the trench jacks provide protection greater than or equal to timber cross bracing.

E. In trenches four (4) feet deep or greater, the Contractor shall provide adequate means of trench egress using ladders or steps. Ladders must extend three (3) feet above the existing ground level. Ladders shall be positioned in accordance with the following:

Trench Length	Position of Ladder
Less than 10 feet	At center
Less than 25 feet	At third points
Less than 50 feet	At each end and center
Greater than 50 feet	Not more than 25 feet

3.04 SUPERVISION

A. The Contractor shall provide competent supervisory personnel at each trench while work is in progress, to ensure that the Contractor's methods, procedures, equipment and materials pertaining to the safety systems, are sufficient to meet the requirements of OSHA Standards and Regulations.

3.05 MAINTENANCE

A. The safety system shall be maintained in its original condition. The Contractor shall take all necessary precautions to ensure that the safety systems are not damaged during their use. If, at any time during its use, a safety system is damaged, personnel shall be immediately removed from the trench or excavated area and the safety system repaired. The Contractor shall take all necessary precautions to ensure that no excessive loads are imposed on the excavation.

3.06 INSPECTION

A. The Contractor shall make a daily inspection of the trench safety system to ensure that the system meets OSHA requirements. Daily inspections shall be made by competent personnel. If evidence of possible cave-ins or slides is apparent, all work in the trench shall cease until the necessary precautions have been taken to safeguard personnel entering the trench. The Contractor shall maintain permanent records of all daily inspections.

3.07 REMOVAL

A. Backfilling and removal of trench supports shall progress together from bottom of trench upwards. The Contractor shall remove no braces or trench supports until all personnel have evacuated the trench. The trench shall be backfilled to within five (5) feet of natural ground prior to removal of the entire trench safety system. None of the trench safety system can remain in-place without the written permission of the Owner's Representative.

*****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.

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. 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. 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, which ever 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. 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. 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 02401 – DRAINAGE PIPE

1.01 GENERAL

A. The Contractor shall furnish and install drainage pipes of the size and type and at the invert elevations shown on the Drawings.

1.02 MATERIALS

A. Corrugated Steel Pipe:
Where shown on the Drawings as "CMP", the drainage pipe and required coupling bands shall be corrugated galvanized steel and shall conform to the requirements of Section 943 of the FDOT Specifications.

B. Corrugated Aluminum Pipe:
Where shown on the Drawings as "Aluminum CMP" or "Alum. CMP", the drainage pipe and required coupling bands shall be corrugated aluminum and shall conform to the requirements of Section 945 of the FDOT Specifications.

C. Concrete Pipe:
Where shown on the Drawings as RCP, the drainage pipes shall meet the requirements of ASTM C76-70 (Class III) and Sections 941 and 942 of the FDOT Specifications, unless otherwise noted.

D. PVC Pipe:
Where shown on the Drawings as PVC, the drainage pipe and fittings shall be Sch. 40, Polyvinyl Chloride, and shall conform to the requirements of Section 948-4 of the FDOT Specifications, unless otherwise noted.

E. Bituminous Pipe Coating:
Where shown on the Drawings as Asphalt Coated, metal pipe, "ACCMP", the pipe and fittings shall be bituminous coated inside and out in conformance with Section 943 of the FDOT Specifications.

F. Filter Cloth:
Where required shall be Amoco Propex 4545, or equal, approved by Engineer prior to ordering.

G. Mitered End Sections:
Mitered end sections shall be constructed in accordance with the applicable D.O.T. Road Design Standard Index (No 272, 273 or 274) call for on the Drawings.

H. Flared End Sections:
Flared end sections shall be constructed in accordance with the applicable D.O.T. Road Design Standard Index (No. 270) called for on the Drawings.

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

SECTION 02402 – DRAINAGE STRUCTURES

1.01 GENERAL

A. Under this item, the Contractor shall build and/or install new catch basins, manholes, dropholes, drop inlets, junction boxes, leaching basins and the like of the types and at the locations shown on the Drawings.

1.02 MATERIALS

A. The materials used in the construction of these structures shall comply with Section 03450 "Portland Cement Concrete" (Type II), Section 03200, "Reinforcing Steel: (Grade 40), and Section 425-3 "Materials" of the FDOT Specifications.

B. Sand-cement riprap shall conform to Section 04050 of these Specifications.

1.03 CONSTRUCTION DETAILS

A. Construction of the structures shall conform to the details as shown on the Drawings and, unless otherwise specified, shall conform with Section 425 "Inlet, Manholes, and Junction Boxes" of the FDOT Specifications. Required minimum compaction shall be 95 percent of maximum density (AASTTO T-180) in areas of paving or curbing.

B. The Contractor shall submit shop drawings for review and approval on all precast structures prior to granting fabrication approval.

1.04 GRATES, FRAMES, AND COVERS

A. Grate, frame and cover castings shall be of uniform quality and free from blowholes, porosity, hard spots, shrinkage, cracks or other injurious defects. They shall be smooth and well cleaned by shot blasting and, unless otherwise specified, shall be covered with a smooth coating of coal tar pitch varnish of a type which will be tough, tenacious, and resilient throughout the range of expected service temperatures.

B. Material used in the manufacture of the castings shall conform to ASTM Specifications A-48 Class 30 Iron or to United States Government Specifications QQI-652, (latest revision) for gray iron castings.

C. All castings shall be manufactured true to pattern and with a close fit of component parts. Frames and covers in roadway and traffic areas shall be of non-rocking design or shall have machined bearing surfaces so that fitting parts will not rattle or rock under traffic.

D. All grates, frames and covers located within road right-of-way or traffic areas shall be capable of withstanding the AASHTO H-20 vertical, dynamic wheel load.

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

SECTION 02403 – INSTALLATION OF DRAINAGE PIPE AND STRUCTURES

1.01 SCOPE

A. This section covers the handling of materials and the work required to install, construct and join, piping, fittings, and appurtenances for a complete drainage system as shown on the Drawings and specified herein.

1.02 GENERAL REQUIREMENTS

A. All work shall be proved to be in first class condition and constructed properly in accordance with the Drawings and Specifications. All defects and leaks disclosed by required testing shall be remedied. All tests shall be performed by the Contractor and observed by the Engineer.

B. All pipe and structures shall be installed on dry, firm bedding. The free-water surface shall be lowered to at least 12 inches below the bedding surface prior to placing pipe or structures and shall be maintained at that depth throughout bedding, haunching, and initial backfilling of the work. During subsequent backfilling, the water level shall be kept sufficiently below the working surface to allow compaction of backfill to the required density, and until required density tests have been performed.

C. Temporary supports shall be installed for adequate protection and maintenance of all underground and surface structures, water lines, drains, and other obstructions encountered in the progress of the work. Any structures which may have been disturbed shall be restored upon completion of the work.

D. Blasting shall not be permitted except by written approval of the Engineer and the District.

E. Trenching and subsequent backfilling within the general construction site shall be accomplished as expeditiously as possible in order to prevent trench decay and maintain a clear operational area.

F. Prior to any excavation or trenching outside the designated limits of the work site, the Contractor shall secure the necessary permits and/or authorization from the applicable Owner, or confirm that such has been previously obtained. The stipulations of said permit or authorization shall be completely followed and, prior to construction operations, notice shall be provided to the appropriate Owner and Engineer.

G. All work shall be installed in accordance with these specifications, the applicable sections of the FDOT Specifications, manufacturers recommendations and the Drawings.

1.03 HANDLING MATERIALS

A. Pipe, fittings, and accessories shall be loaded and unloaded by hand or skidding so as to avoid shock or damage. Under no circumstances shall such materials be dropped. Pipe handled on skidways shall not be skidded or rolled against pipe already on the ground.

B. In distributing the material at the site of the work, each piece shall be unloaded opposite or near the place where it is to be laid in the trench.

1.04 ALIGNMENT, GRADE, AND COVER FOR BURIED PIPING SYSTEMS

A. Pipe shall be laid and maintained to the required lines, depths, and grades.

B. Wherever obstructions not indicated on the Drawings are encountered during the progress of the work and interfere to such an extent that an alteration in the Drawings is required, the Engineer will order a deviation from the line and grade or arrange with the owners of the structures for the removal, relocation, or reconstruction of the obstructions.

C. The maximum permissible deflection for pipe and fittings shall be as recommended by the manufacturer.

D. Installation of drainage pipe less than 18" diameter in runs of 100 feet or greater, or as required by the Engineer, shall be controlled by use of a laser to maintain proper grade. The Contractor shall also be responsible for verifying elevations of the pipe, as indicated on the Drawings, at sufficient points during progress of the work to identify discrepancies between actual and plan elevations due to laser misalignment, equipment error, etc., and to correct the work as required to conform to the Drawings.

1.05 PIPE TRENCH EXCAVATION

A. Trench Dimensions

1. The minimum width of the trench shall be equal to the outside diameter of the pipe at the joint plus 8 inches for unsheeted trenches, or 12 inches for sheeted trench, and the maximum width of trench, measured at the top of the pipe, shall not exceed the nominal pipe diameter plus two feet, unless otherwise shown on the Drawing details or approved by the Engineer. Trench walls shall be vertical from the bottom of the trench to a line measured one foot above the top of the pipe. From one foot above the top of the pipe to the surface, the trench walls shall be as nearly vertical as soil conditions will permit, unless otherwise detailed on the Drawings. Spaces for joints, fittings, manholes and other structures shall be maintained unless otherwise approved by the Engineer, or alternate methods are detailed on the Drawings. Should the

specified maximum width of trench be exceeded, the pipe shall be adequately reinforced as directed by the Engineer, at the Contractor's expense.

2. Trench grade for pipe or structures not requiring special bedding material shall be defined as the grade of the bottom surface of the utility or structure to be constructed or placed within the trench. Such shaping of the trench bottom, as may be required to provide suitable bedding, shall be considered to be a part of this work. Trench grade in non-cushioning material shall be defined as 6 inches below the outside of the bottom of the utility, which 6 inches shall be backfilled with suitable bedding material. Unauthorized excavation below trench grade shall be backfilled to trench grade and suitable compacted by the Contractor without additional cost to the Owner. Final trimming and grading of trench bottom shall be done manually.

1.06 BACKFILL AND BEDDING MATERIALS

A. Type 1:
Type 1 material shall be either well-graded crushed stone or crushed gravel meeting the requirements of ASTM Designation C33-71a, Gradation 67 (3/4 inch to No. 4 Sieve) or air cooled blast furnace slag along or in combination with crushed stone and/or crushed gravel conforming to ASTM Designation C33-71a requirements. This material shall be used primarily for pipeline and manhole foundations.

B. Type 2:
Type 2 material shall be unclassified material obtained from the Contractor's excavations and approved by the Engineer. The material shall be substantially free from wood, roots, humus, peat, muck, and other organic materials, and shall not contain clods, stones, masonry rubble, and the like, greater that 6 inches through the largest dimension. In general, the material shall consist of sand, loam, sandy-loan, clayey-sand, gravel, or crushed stone.

C. Type 3:
Type 3 material shall be select granular material, free from organic matter, of such size and gradation that the desired compaction can be readily attained and shall meet the requirements for A3 material according to the Revised Bureau of Public Roads Classifications. Material from the Contractor's excavations may be used, if it meets the above requirements. Otherwise it must be imported.

1.07 BEDDING AND FOUNDATIONS

A. Class A (Concrete Cradle or Concrete Arch Bedding)

1. This class of bedding shall be used only where specifically shown in the Drawings or directed by the Engineer. If the use of a concrete cradle is required the pipe shall be bedded in a monolithic cradle of a 1,500 PSI

concrete with a minimum thickness equal to ¼ the outside pipe diameter or to a minimum of four inches under the barrel, whichever is greatest, and extending up to the sides of the pipe to a height equal to ½ of the outside pipe diameter. The cradle shall have an overall width equal to 1¼ of the outside diameter of the pipe or a minimum width equal to the outside diameter of the pipe plus eight inches, whichever is greater.

2. If concrete arch is required, the pipe shall be embedded in carefully compacted Type 1 material having a minimum thickness equal to ¼ the outside pipe diameter or to a minimum of four inches under the barrel, whichever is greater, and extending up the side for a height equal to ½ of the outside pipe diameter. The top half of the pipe shall be covered with a monolithic Class C concrete arch having a minimum thickness equal to ¼ the outside diameter of the pipe or a minimum of four inches over the crown of the pipe, whichever is greater, and extending down the sides for a depth equal to ½ of the outside pipe diameter. The arch shall have an overall width equal to 1¼ of the outside diameter of the pipe or a minimum width equal to the outside diameter of the pipe plus eight inches, whichever is greater.

B. Class B (First-Class Bedding):

1. Where Class B Bedding is required, the trench shall be excavated below the planned bottom of the pipe to a depth equal to ¼ the nominal diameter of the pipe, or 6 inches, whichever is greater. The over excavated depth shall be backfilled using either Type 1 or Type 3 materials carefully compacted and shaped using hand tools so as to provide a uniform support for the lower portion of the pipe barrel. Shaping under the pipe belts shall be so that the bell does not support the pipe and joints can be made without bedding material interference.

2. At the option of the Contractor, Class B Bedding may be used in place of Class C (Ordinary Bedding) provided that the exercise of this option shall create no additional expense to the Owner. The Contractor shall notify the Engineer in writing of those portions of the project on which he proposes to exercise this option.

C. Class C (Ordinary Bedding):

1. The bottom of the trench shall be hand shaped to provide a firm bedding for the utility pipe. The utility shall be firmly bedded in undisturbed firm soil. The bedding shall be shaped so that the pipe will be in continuous contact therewith for its full length and shall provide a minimum bottom segment for the pipe equal to 0.6 of the outside diameter of the barrel. Excavation under the bell shall be sufficient so that the bell does not support the pipe and the joint can be made without interference.

D. Unsuitable Bedding Material:

1. Class C Bedding shall be used for all pipeline construction unless otherwise shown on the Drawings or unless unsuitable material is encountered at the bedding surface. In the event that the materials encountered at normal bottom of trench excavation are, in the judgment of the Engineer, unsuitable to act as foundation for the pipe, such material shall be excavated for the full width of the trench to the depth necessary to obtain a suitable foundation. The Engineer will notify the Contractor, in writing, of the necessity for and extent of the material to be removed and the Contractor shall remove such unsuitable material as soon as possible and backfill in accordance with the requirements of Class B Bedding. All unsuitable material shall be disposed of by the Contractor.

108 PIPE TRENCH BACKFILL

A. Initial Backfill:

1. Initial backfill shall be placed as soon as possible after laying the pipe and shall maintain a pace with the pipe laying so that no more than five pipe joints separate laying and backfilling operations. Initial back fill shall include all haunching and backfill from the top of the bedding to a compacted depth of twelve inches over the pipe. All haunching and backfilling shall be done in the dry.

2. Initial backfill shall be done as specified below:
    a. Haunching of the pipe shall be by hand placement and compaction of material in maximum 4 inch layers from the bottom of the trench to the spring line of the pipe, taking care to fill all voids below and around the pipe. Backfilling shall be carefully continued in layers not exceeding 6 inches in thickness for the full trench width until the compacted fill is 12 inches above the top of the pipe.
    b. During initial backfilling the fill shall be deposited evenly along both sides of the pipe from a height not to exceed 2 feet above the top of pipe, and fill shall not be dropped directly on the unprotected pipe surface.
    c. Where thrust blocks, encasement, or other cast-in place concrete items are below grade, no backfilling shall start until the specific items have been inspected and approved by the Engineer or his authorized representative.
    d. The backfill to one foot above the top of the utility shall be thoroughly compacted with curved end tamping bars under and on each side of the pipe and flat tamped between the pipe and trench wall and shall be completed before the remainder of the trench is backfilled. Initial backfill shall be compacted to 900 percent of

maximum density as determined by AASHTO T-180. No subsequent backfill will be permitted until the initial backfill has been accepted by the Engineer or his authorized representative.

B. Subsequent Backfill:

1. Subsequent backfill is that backfill between the initial backfill and the finished ground level or bottom of subbase.

2. Subsequent backfill material shall be placed full trench width in horizontal layers not exceeding 12 inches loose depth and compacted by power-operated tampers, rollers, or vibratory equipment to a density equal to 98 percent of the maximum density as determined by AASHTO T-180 for pipe placed under the adjacent to roadways or paved surfaces, and 95 percent under areas where no pavement is to be constructed and vehicular traffic is not to pass over the pipe. Each layer shall be compacted to the specified density prior to placing subsequent layers. The thickness of the loose layer may be increased when in-place density tests show that the specified density can be obtained.

C. Backfill Material:

1. Type 2 material shall be used for initial backfill and subsequent backfill with the following conditions: Initial backfill shall be predominately sandy material free from rock or stone greater than 1-1/2 inches in diameter, and the maximum allowable dimension of a stone or rock fragment for subsequent backfill shall be 6 inches. If in the opinion of the Engineer the Type 2 material will not provide adequate and uniform support for load distribution to the pipe, the Contractor shall obtain and place either Type 1 or Type 3 backfill as determined by the Engineer.

2. All excavated material not suitable for backfill shall be placed on site at an acceptable location, by Owner, or hauled off the job at the price set forth in the accepted Bid Documents. All material that is brought in from other source for backfill shall be at the price set forth in the Contract.

3. Excavated material to be used for backfill shall be neatly deposited at the side of the trenches where space is available to protect against caving or sloughing into the trench. Where stockpiling of excavated material is required. The Contractor shall coordinate the site location with the Engineer and shall maintain his operations to provide for natural drainage and not present an unsightly appearance. No excavated material shall be place on private property without the consent of the property owner.

4. 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.

5. Generally, in-place density tests shall be performed at approximately 20 foot intervals; one each side of pipe for each 12-inch lift. Additional density tests may be required by the Engineer. If any tests results are unsatisfactory, the Contractor shall re-excavate and recompact the backfill at his expense until the required compaction is obtained.

1.09 PIPE SYSTEM LAYING AND JOINTING

A. General:

1. Unless otherwise specified herein or directed by the Engineer, all pipe and fillings shall be laid and joined in accordance with the appropriate manufacturer's directions with regard to allowable barrel and joint deflection, spigot seating depth, gasket placement, lubrication, bolt torque, field cutting/trimming, and pushing/pulling methods for joint assembly.

2. Prior to placing in the trench, each pipe section, joint, and fitting shall be checked for damage or defects such as cracks, blisters, coating/lining separation, gouges, and the like. Any damage or defective materials found shall not be reinstalled unless approved by the Engineer and shall be marked "REJECTED" and immediately removed from the work site.

3. Prior to installation, the interior of all pipe and fittings shall be inspected for debris, sediment accumulation, sand and the like, and shall be cleaned as required to remove such foreign matter. Joint surfaces such as gaskets, gasket grooves, spigots, and bells shall be cleaned of sand and grit prior to joining.

4. Gasket lubricants shall be stored and applied in a manner that will prevent significant contamination or pick-up sand and grit.

5. The pipe spigot shall be centered in and aligned with it mating bell prior to insertion and forced evenly in a straight line to seating depth, take care not to over-bell the joint. Where required, deflections shall be made after the joint is seated.

6. Joining shall generally be done by hand or by push-bar with a cushion block whenever pipe size and weight permit. When a mechanical pushing/pulling device such a chain-puller, come along, and the like is required, the device shall be used in a manner that will not deform gouge, chip, or otherwise damage the pipe or cause significant disturbance of the prepared bedding. In no case shall joints be made by "popping-on" or swinging the spigot into the bell to seat the joint.

7. Fittings and appurtenances shall be fully, independently supported on the bedding or on a permanent foundation so as not to bear on the pipe upon completion of the installation.

8. The installed piping system shall be kept free of dirt, trench water, and other foreign matter during the progress of the work, and all open ends of the line shall be sealed with watertight plugs whenever work is not in progress.

1.10 INSTALLATION OF FITTINGS

Fittings, plugs, and caps shall be set and jointed to pipe in the manner heretofore specified for cleaning, laying and jointing pipe.

1.11 INSTALLATION OF DRAINAGE STRUCTURES

A. Excavation for drainage structures shall be of sufficient size to permit construction of the structure to progress without hindrance from the walls of the excavation or from sloughed materials. No less than 12 inches clearance shall be provided between excavation walls and walls of the structure. If soil conditions encountered at the bottom of the excavation would in the sole opinion of the Engineer be unsuitable for foundation, the Contractor shall remove and dispose of the unsuitable material to the depth where suitable bearing can be obtained. The determination of the necessity for and the extent of additional excavation shall be made by the Engineer, who shall inform the Contractor in writing regarding such necessity and the extent. This excavation shall then be backfilled to the appropriate grade with Type 1 or Type 3 backfill material, placed in 8 inch layers and compacted to a density equal to 100 percent of the maximum density as determined by AASHTO T-180.

B. Installation of drainage structures shall conform to the details as shown on the Drawings and, unless otherwise specified, shall conform with Section 425 of the 1986 Edition of the Florida D.O.T. Standard Specifications for Road and Bridge Construction. Backfill shall be placed in lifts not to exceed 12 inches loose depth and compacted to 95 percent of maximum density per AASHTO 5-180 in unpaved areas and to required subgrade density in areas of paving or curbing.

C. Backfill shall not be placed against cast-in-place concrete structures until the concrete has attained sufficient strength to resist the load without damage, and in no case, less than seven days after the concrete was placed.

1.12 AS-BUILT DRAWINGS

A. During the installation of Drainage Pipe and Structures the Contractor shall keep accurate records of the As-Built construction showing the location of all changes in alignment, services, utility crossings, and similar data. Items shall be located from permanent objects such a centerline of street, manhole, valves, etc. Upon

completion of the project the Contractor shall deliver to the Engineer an As-Built Drawing showing the above information.

*****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 03341 – CELLULAR CONCRETE ROOF FILL ON INSULATION BOARD

PART 1 – GENERAL

1.01 SECTION INCLUDES

A. Cellular lightweight insulating concrete roof deck.
B. Insulation Board.
C. Metal Decking.

1.02 RELATED SECTIONS

A. Section 05300 - Metal Decking: Steel roof deck and accessories.
B. Section 06100 - Rough Carpentry: Wood blocking, curbs.
C. Section 07220 - Roof and Deck Insulation.
D. Section 07516 - Fully Adhered Single Ply Roofing.
E. Section 07715 - Drip Flashings.

1.03 REFERENCES

A. American Society for Testing Materials (ASTM).

1. ASTM A525 – Steel Sheet Zinc Coated (Galvanized) by Hot Dip Process.
2. ASTM C150 – Portland Cement.
3. ASTM C495 – Compressive Strength of Lightweight Insulating Concrete.
4. ASTM C796 – Foaming Agents used in Producing Cellular Concrete Using Preformed Foam.
5. ASTM C869 – Foaming Agents used in Making Preformed Foam for Cellular Concrete.

B. Factory Mutual (FM)

1. Roof Assembly Classifications

C. Florida Building Code, Current Edition

D. Steel Deck Institute (SDI)

1. Diaphragm Design Manual DDMO3 Third Edition, 2004.

1.04 PHYSICAL PROPERTIES:

A. Minimum Compressive Strength: **500** psi.

1.05 SUBMITTALS

A. Submit shop drawings and product data under the provisions of Section 1300-Submittals.

B. Indicate roof plan, layout of roof-mounted equipment, slopes and adjoining surfaces.

C. Submit product data for cellular concrete, insulation board and metal deck.

D. Submit mix-design data.

E. Submit test reports indicating that cellular insulating concrete physical properties for compressive strength and density meet specification requirements.

F. Submit manufacturer's certificate that products meet or exceed specified requirements.

G. Submit manufacturer's installation instructions.

1.06 QUALIFICATIONS

A. Foam Concentrate:
The foam concentrate used to produce the cellular lightweight insulating concrete must have a trouble free history of at least five years with acceptable documentation of UL and FM Approvals.

B. Applicator:
Company specializing in application of cellular lightweight insulating concrete with minimum of five years documented experience and approved by the manufacturer.

1.07 REGULATORY REQUIREMENTS

A. Conform to Florida Building Code for roof assembly fire hazard requirements.

B. Roof Assembly Classification:
FM Class I-90 construction, in accordance with FM construction Bulletin 1-28.

C. Provide certification of inspection confirming approval of Department of Education for all school projects.

1.08 DELIVERY, STORAGE AND HANDLING

A. Deliver all materials and/or products to the job site in manufacturer's original, unopened containers or acceptable bulk handling, with legible labels and in sufficient quantity to allow for continuity of work.

B. Provide appropriate protection to those materials subject to degradation from weather conditions, i.e., moisture, wind, extreme cold or heat as per manufacturer's recommendations.

C. Store packaged products off ground in manner to protect them from elements, especially moisture damage.

D. Remove products from site that show indication of moisture damage, caking or other signs of deterioration and replace with undamaged materials.

1.09 ENVIRONMENTAL REQUIREMENTS

A. Avoid installation of cellular lightweight insulating concrete when outside temperatures will be below 40 F.

B. When it is anticipated that outside temperatures will be below 40 F 24 hours after placing concrete, heat mixing water to maximum of 120 F.

PART 2 – PRODUCTS

2.01 MATERIALS

A. Insulating Concrete:
1. Foaming Agent: "Celcore" foam concentrate as manufactured by Celcore, Inc., Fort Lauderdale, Florida or "Mearlcrete Cellular Concrete" of Roselle Park, N.J.

2. Portland Cement:
ASTM C150, Type I unless otherwise approved.

3. Water:
Clean, fresh and free from injurious quantities of acid, alkali, salt, oil, organic matter or other impurities.

4. Admixtures:
Do not use admixtures without the approval of the insulating concrete manufacturer; use approved admixtures in strict accordance with manufacturer's recommendations.

B. Insulation Board:
Foam plastic (polystyrene), with a minimum one (1) pcf density: fabricate board with 8 – 2½ inch +/- ½ inch diameter holes to provide a positive keying action; Factory Mutual (FM) and UL approved.

C. Metal Deck:
In accordance with Section 5300 and as per the Structural Drawings.

2.02 MIXES:

A. Mix materials in accordance with recommendations of manufacturer to yield the specified physical properties.

B. Mix and pump cellular lightweight insulating concrete into place using a mixing plant approved by the manufacturer. Thoroughly blend all materials before discharging the mixer.

C. Maintain a wet density of 35 pcf +/-7 pcf at the place of deposit.

D. Maintain a consistency suitable to provide a plastic mix capable of being screeded to a smooth finish.

PART 3 – EXECUTION

3.01 EXAMINATION

A. Examine surfaces for inadequate anchorage, foreign material, moisture and unevenness which would prevent proper application of insulating cellular concrete.

B. Beginning of installation means applicator accepts existing surface/substrate conditions.

3.02 PREPARATION

A. Cover roof deck penetrations, drains, etc., before installing insulating concrete.

B. Clean surfaces/substrate of deleterious material and water.

C. Set screeds to assure insulating concrete is applied to the required depth.

D. Protect elements surrounding the work of this Section from damage or disfiguration.

3.03 INSTALLATION

A. Install metal deck in accordance with Plans, Specifications, and/or applicable codes.

B. Place insulating concrete slurry to a minimum thickness of 1/8 inch over top of corrugations or substrate.

C. Embed insulation board into slurry. Butt board edges, stagger end joints. Embed

insulation board within 30 minutes of placing slurry coat on the substrate.

D. Place insulating concrete on top of the insulation board to a minimum thickness of two (2) inches.

3.04 FIELD QUALITY CONTROL

A. Field inspection and testing will be performed under the provisions of Section 1400 - Quality Control.

B. Test insulating concrete in accordance with ASTM C495 as modified below:

1. Test specimens to be cylinder six (6) inches in diameter and twelve (12) inches in length. Provide two (2) cylinders per mixer batch.

2. During molding, place the concrete in two (2) approximately equal layers. Raise and drop the cylinders approximately one (1) inch three (3) times on a hard surface after placing each layer. Do not rod the concrete.

3. Keep concrete in molds for a minimum of seven (7) days.

3.05 PROTECTION

A. Apply a polyvinyl alcohol (PVA) curing membrane, spray applied, over the deck surface as soon as the deck will support foot traffic for protection against excessive evaporation or dry out. This (PVA) membrane shall be an integral part of the deck system. Prevent excess roof traffic for 24 hours.

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

SECTION 03420 - PRECAST CONCRETE LINTELS

PART 1 - GENERAL

1.01 DESCRIPTION OF WORK

Furnish and install all required Precast Lintels and Door Headers in the locations called out on the architectural and structural drawings as manufactured by WEKIWA CONCRETE PRODUCTS, INC. or an approved equal. Lintels available through CSR Rinker (Cemex Corp.).

1.02 RELATED WORK SPECIFIED ELSEWHERE

Concrete Formwork	Section 03100
Concrete Reinforcement	Section 03200
Cast in place Concrete	Section 03300

1.03 QUALITY ASSURANCE

A. ASTM Standards (Latest Editions):
   1. ASTM A615 (Grade 60) for reinforcing bars.
   2. ASTM A416, 7 wire for prestress strands.

B. ACI Standards (Latest Editions):
   1. ACI 315, Detail Reinforcement.
   2. Concrete Operations shall comply with ACI Standards.
   3. Design and Construction shall conform to the specification of the national concrete masonry association and ACI 530.
   4. ACI 318-95, Building Code Requirements for Structural Concrete.

C. Florida Building Code, latest edition.

D. American Society of Civil Engineers minimum design loads for Buildings and Other Structures (ASCE 7-95).

PART 2 - PRODUCTS

2.01 CONCRETE

A. Concrete Compressive Strength at 28 days:
   1. Pre-cast w/standard reinforcement- 3500 PSI.
   2. Pre-cast w/prestress reinforcement- 5000 PSI.
   3. Concrete Fill (placed in field)- 3000 PSI.

2.02 MASONRY

A. Minimum masonry unit strength fm 1500 PSI.
B. Mortar shall be type-M.

2.03 REINFORCING MATERIALS

A. Reinforcing bars: ASTM A615 (grade 60).
B. Prestress Strands: ASTM A416, 7-wire.
C. Steel is placed in the precast lintel at time of fabrication.
D. Minimum coverage of steel to be 3/4 inch for top bars and 1.5 inches for bottom bars.

PART 3 - EXECUTION

3.01 DELIVERY, STORAGE, AND HANDLING

A. Deliver precast concrete units to project site in such quantities and at such times to assure continuity of installation.

B. Store units at project site to ensure against cracking, distortion, staining, or other physical damage, and so that markings are visible.

3.02 INSTALLATION

A. Lift and support units at designated lift points. Shoring of precast units shall be installed and removed solely by the contractor under the direct supervision of the manufacturer.

B. Minimum bearing required at each end is 4 inches. Bearing preferred is 8 inches.

C. Do not install any damaged units.

3.03 DEFECTIVE WORK

A. Precast concrete units which do not conform to specified requirements, including strength, tolerances, and finishes, shall be replaced with precast concrete units that meet requirements of this section. The contractor shall also be responsible for the cost of corrections to any other work affected by or resulting from corrections to precast lintels.

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

SECTION 03420 - PRECAST CONCRETE LINTELS

PART 1 - GENERAL

1.01 DESCRIPTION OF WORK

Furnish and install all required Precast Lintels and Door Headers in the locations called out on the architectural and structural drawings as manufactured by WEKIWA CONCRETE PRODUCTS, INC. or an approved equal. Lintels available through CSR Rinker (Cemex Corp.).

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Concrete Formwork	Section 03100
Concrete Reinforcement	Section 03200
Cast in place Concrete	Section 03300

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   3. Design and Construction shall conform to the specification of the national concrete masonry association and ACI 530.
   4. ACI 318-95, Building Code Requirements for Structural Concrete.

C. Florida Building Code, latest edition.

D. American Society of Civil Engineers minimum design loads for Buildings and Other Structures (ASCE 7-95).

PART 2 - PRODUCTS

2.01 CONCRETE

A. Concrete Compressive Strength at 28 days:
   1. Pre-cast w/standard reinforcement- 3500 PSI.
   2. Pre-cast w/prestress reinforcement- 5000 PSI.
   3. Concrete Fill (placed in field)- 3000 PSI.

2.02 MASONRY

A. Minimum masonry unit strength fm 1500 PSI.
B. Mortar shall be type-M.

2.03 REINFORCING MATERIALS

A. Reinforcing bars: ASTM A615 (grade 60).
B. Prestress Strands: ASTM A416, 7-wire.
C. Steel is placed in the precast lintel at time of fabrication.
D. Minimum coverage of steel to be 3/4 inch for top bars and 1.5 inches for bottom bars.

PART 3 - EXECUTION

3.01 DELIVERY, STORAGE, AND HANDLING

A. Deliver precast concrete units to project site in such quantities and at such times to assure continuity of installation.

B. Store units at project site to ensure against cracking, distortion, staining, or other physical damage, and so that markings are visible.

3.02 INSTALLATION

A. Lift and support units at designated lift points. Shoring of precast units shall be installed and removed solely by the contractor under the direct supervision of the manufacturer.

B. Minimum bearing required at each end is 4 inches. Bearing preferred is 8 inches.

C. Do not install any damaged units.

3.03 DEFECTIVE WORK

A. Precast concrete units which do not conform to specified requirements, including strength, tolerances, and finishes, shall be replaced with precast concrete units that meet requirements of this section. The contractor shall also be responsible for the cost of corrections to any other work affected by or resulting from corrections to precast lintels.

*****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: $f'm$ 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 05030 - POWDERED COATINGS

PART 1 - GENERAL

1.01 SECTION INCLUDES

A. Powdered coating applied to metal surfaces.

1.02 RELATED SECTIONS

A. Entrance Storefront Doors - Section 08400.
B. Flush Glazed Storefront Windows - Section 08410.
C. Aluminum Windows - Section 08520.
D. Glazed Curtain Walls - Section 08900.
E. Louvers and Vents - Section 10200.
F. Sectional Overhead Doors: Aluminum - Section 08360.

1.03 SUBMITTALS

A. Properly identified product data.
B. Manufacturer's full range of custom colors, texture and gloss.
C. Manufacturer's data sheet including cleaning recommendations.

1.04 REFERENCES

A. American Architectural Manufacturer's Association (AAMA):

1. AAMA 605.2-90 - Voluntary Specification for High Performance Organic Coatings on Architectural Extrusions and Panels, with the following exceptions.

a. Five-year South Florida exposure test will be met effective March 1996.
b. Due to environmental considerations acid chromate surface preparation is not used.

B. American Society for Testing and Materials (ASTM):

1. ASTM D117-89 Guide to Test Methods and Specifications For Electrical Insulating Oils of Petroleum Origin.
2. ASTM D522-85 Test Method for Elongation of Attached Organic Coatings With Conical Mandrel Apparatus.
3. ASTM D523-85 Test Method for Specular Gloss.
4. ASTM D2247-87 Practice For Testing Water Resistance of Coatings in 100% Humidity.
5. ASTM D2794-84 Test Method for Resistance of Organic Coatings on the

Effects of Rapid Deformation (Impact).

6. ASTM D3359-87 Method For Measuring Adhesion by Tape Test, Method B.
7. ASTM D3363-74 Test Method For Film Hardness by Pencil Test.

1.05 QUALITY ASSURANCE

A. The manufacturer of the powdered coating shall have produced the coating products for not less than five years and shall be capable of furnishing both products and instructions for touch-up.

B. The manufacturer of the powdered coating shall provide each applicator or fabricator of items which receive the coating with 3 by 5 inch samples of color(s) to be used, as standard of uniform quality during the shop finishing operation.

C. Items to be coated in the powdered coating shop shall be protected in their bare metal state while in transit to the powdered coating shop.

1.06 GUARANTY

A. After final acceptance, furnish Owner written guarantee against defective organic powdered coating material and application **for a period of six (6) years.**

PART 2 - PRODUCTS

2.01 MANUFACTURERS

A. **"Archkote 6000"** Powdered Coating by Arch Aluminum & Glass Co., Inc., 10200 NW 67th Street, Tamarac, FL 33321, Toll-Free Hotline: 866.629.ARCH.

1. Powdered coating composed of pure polyester TGIC, dry powder including resins and pigments according with requirements of AAMA 605.2.
2. Provide sandblast and cleaning materials as needed to prepare surfaces and to clean up.
3. Color shall be an RAL color per Architect's selection.

B. **"Tiger Drylac"** Powder Coatings
2605 Beltline Avenue, Reading, PA 19605 Tel. (215) 921-9697

2.02 PRODUCT QUALITY AND CHARACTERISTICS

A. Powdered coating composed of pure polyester TGIC, dry powder including resins and pigments according with requirements of AAMA 605.2.

B. Powder Coating Characteristics:

	Glossy Surface	**Semi Gloss Surface**	**Mat Surface**
Thickness	2.503.5 mils /60-90	2.5-3.5 mils /60-90	2.5-3.5 mils /60-90
Gloss	80-90	55-65	15-25
Cross Hatch Adhesion (2)	Pass 100%	Pass 100%	Pass 100%
Mandrel Bending (3)	1/8"/3mm	5/32"/4mm	3/16"/5mm
Erichsen Cupping ISO 1520	5/16"/8mm	1/4"/7mm	3/16"/5mm
Impression Hardness (4)	95	95	95
Impact Test (5)	Up to 160" /lb.	Up to 160" /lb.	Up to 160" /lb.
Pencil Hardness (6)	2H (min.)	2H (min.)	2H (min.)
Dry Mill Test	OK	OK	OK
Salt Spray Test (7)	3000 h test, max.undercut. 1/16"/1mm	3000 h test, max.undercut. 1/16"/1mm	3000 h test, max.undercut. 1/16"/1mm
Humidity Resistance (8)	3000 h test, min.blisters 1/16"/1mm	3000 h test, min.blisters 1/16"/1mm	3000 h test, min.blisters 1/16"/1mm

(1) Gloss According to Gardner 60 Degrees, ASTM D523.
(2) Cross Hatch Adhesion, ASTM D3359 Method B.
(3) Mandrel Bending Test, Astm D522.
(4) Impression hardness according to Buchholz ISO 2215.
(5) Impact Test, ASTM D2794, 1/10" distortion.
(6) Pencil Hardness, ASTM D3363.
(7) Saltspray Resistance Test, ASTM D117.
(8) Humidity Resistance Test, ASTM D2247.

2.03 ACCESSORY MATERIALS

A. Provide sandblast and cleaning materials as needed to prepare surfaces and to clean up.

2.04 SHOP APPLICATION CONDITIONS

A. Apply and cure coating in dust free surroundings, in a humidity range of 30 to 85 percent, and in a surrounding air temperature of not less than 50 degrees F.

B. Do not apply coatings to surfaces which are dirty, dusty, rusty, damp or oily.

PART 3 - EXECUTION

3.01 SURFACE PREPARATION

A. Aluminum: Clean with chemicals or etch to remove grease, dirt and loose oxide film using manufacturer's recommended products.

B. Previously Powdered Coated Metal (touch-up): Remove dirt, grease and bond breaking substances and roughen area to be touched up with fine abrasive paper and touch-up with air dry spray supplied by applicator.

C. Prepare surfaces to receive powder coating and shop apply powder coating in accordance with manufacturer's recommendations.

3.02 COLOR MATCHING

A. Powdered coating shall be formulated and applied so as to maintain uniform color, texture and gloss.

B. All applications of powder coatings shall maintain uniform color, texture, gloss and quality of application to match accepted sample.

3.03 GENERAL APPLICATION REQUIREMENTS

A. Apply powder coating system according to manufacturer's published recommendations.

B. Due to the sensitivity of these coatings to dust pickup during their extended curing times, apply all coats of powder coating system at shop or factory, under dust free, temperature and humidity-controlled conditions.

3.04 POWDERED COATING APPLICATION

A. Pneumatically feed dry powder to spray gun. Impact a low amperage, high voltage charge to the powder.

B. Uniformly spray apply powdered coating to electrically grounded metal surfaces.

C. Allow sprayed surfaces to bake in ovens at temperatures recommended by coating manufacturer.

D. Finished surfaces shall be fully and uniformly coated without pinholes, bubbles, sag, runs, lumps, marks or discoloration. Surface finish shall be of uniform color, texture and gloss.

3.05 TOUCH-UP

A. After powder coating has been in place at least 15 days, and within 30days of Architect-Engineer's inspection of the product prior to certification that the work is complete, check all powder coated surfaces for damage, missed areas and discoloration.

B. Prepare surfaces and touch-up damaged, missed and discolored areas to bring coating system to full dry film thickness, in color and gloss matching that of adjacent coated areas.

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

SECTION 05120 - STRUCTURAL STEEL

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

Drawings and General Provisions of Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to work of this section.

1.02 DESCRIPTION OF WORK

A. This Section includes the labor and materials required for the proper completion of structural steel work as shown on the drawings or specified.

B. Generally, this work is as follows:

1. Furnishing, fabrication and erection of all structural steel beams, columns, trusses, attached lintels, column base and cap plates, including all bolts and welding as required for the complete installation of the work.

2. Furnishing all anchor bolts and leveling plates for installation under other sections.

3. Shop painting and field touch-up of all steel.

4. Erection drawings and shop details.

5. Providing all tools, equipment and temporary bracing required for safe, proper and expeditious erection of the work.

6. Furnishing of all loose lintels.

C. Related work of other sections:

Steel Joists	Section 05210
Metal Decking	Section 05300
Painting	Section 09900

1.03 QUALITY ASSURANCE

A. Codes and Standards: All structural steel work shall comply with the Specifications or the "Design, Fabrication, and Erection of Structural Steel for Buildings", latest edition, issued by the American Institute for Steel Construction, and shall comply with the requirements of local building codes.

B. All welding shall be done by the electric arc process and conform to the Code of Arc and Gas Welding in Building Construction of the American Welding Society. All welding shall be performed by operators qualified in accordance with this code, and holding current certificates.

1.04 SUBMITTALS

A. Shop Drawings shall be submitted in accordance with the Supplementary Conditions, at earliest possible date to insure timely delivery and proper coordination of work by others. No variation from design sizes will be permitted but recommendations for modification of connections or details to better suit fabricator's shop practice will be considered if specifically directed, in writing to the attention of the Architect.

B. Shop Drawings shall include erection plans, details of individual members, and index sheets. If not approved on submittal, shop drawings shall be corrected and resubmitted until final approval of Architect is obtained. Fabrications shall not be started until shop drawings are approved.

C. Detail drawings shall be submitted for reference only and will not be approved or disapproved by Architect.

D. Only shop drawings bearing the approval seal and signature of the licensed professional engineer who supervised their preparation shall be used in the field and all other shop drawings will be considered void.

E. Work under this section includes responsibility for dimensions to be correlated and confirmed in the field and for information that pertains solely to fabrication processes and to techniques of construction.

F. Shop drawings shall include all cutting of members which are required by other trades.

PART 2 - PRODUCTS

2.01 MATERIALS

A. All structural steel shall conform to ASTM A36. Steel shall be new, clean, and straight (foreign steel not acceptable).

B. High tensile strength bolts, nuts and washers shall conform to ASTM A325, or A490.

C. Ordinary unfinished bolts shall conform to ASTM A307.

D. Arc welding electrodes shall conform to ASTM Standards Spec. A233, latest edition.

E. Shop coat of paint shall be Manufacturer's Standard Shop Primer, or approved equal.

2.02 FIELD COORDINATION

A. All measurements shall be verified in the field, particularly for work installed before delivery of steel. Contractor shall notify Architect in writing of any discrepancy between elevations, locations, conditions, etc., shown on the drawings and those actually encountered in the field, and shall not proceed with the work until discrepancies have been resolved.

B. The Contractor shall check all drawings and shall be responsible for completeness and correct fittings of all work.

C. All anchor bolts and plates required to be set in concrete shall be furnished and delivered, together with templates and/or instructions for setting, in ample time for installation by other trades.

2.03 FABRICATION

A. Finished members shall be true to line and free from twists, bends, and open joints between components parts. If straightening or flattening is required, it shall be done in a manner that will not damage the material.

B. Columns and stiffeners shall be milled at bearing ends to true surface, at right angles to the axis or at the proper angle, to insure uniform bearing.

C. Column base plates shall be of sizes indicated on the drawings, with straight and true top and bottom surfaces. Base plates may be straightened by pressing to obtain satisfactory contact bearing.

D. Holes for bolts shall be drilled or punched 1/16" larger than the normal diameter of the bolts. Burning to enlarge unfair holes is not permitted. Holes that must be enlarged shall be remade. Bolts shall fit holes snugly and nuts shall be drawn up tight and shall have full grip in bolts.

E. Provisions of work by other trades: Open holes or studs shall be provided for attaching of work by other trades which adjoins, attaches to, or connects with Structural Steel. Particular notice shall be given to requirements where miscellaneous metal adjoins structural steel.

F. All exposed steel shall be free of stampings, mill scale or imperfections. All cuts

and notches at exposed steel shall be ground and finished smooth. All welds on exposed structural steel shall be filled having an additional bead or beads as required, and ground smooth to receive shop primer coat.

PART 3 - EXECUTION

3.01 ERECTION

A. Columns and struts shall be accurately aligned and beams set to correct level or slope using Surveyor's transit and levels and referring to permanent bench marks. Struts and columns shall be kept plumb during erection for which all temporary, braces, guys, and temporary beams shall be installed and kept in place until work is properly secured. Individual pieces shall be considered plumb or level when the variation does not exceed 1 to 500 and 1 to 1000 for exterior columns.

B. The Building Erector sub-contracted with the General Contractor shall provide all necessary additional bracing, beams, temporary struts, ties, guys, clip angles, etc., that may be required to erect the structural frame and maintain it in alignment until the building is completed, including any extra guying after completion of decking.

C. Welding and bolting of all connections shall follow the setting of the steel as closely as plumbing and alignment will permit.

D. Any variation from the work, as shown on the drawings, which may occur during erection shall be reported to the Architect for adjustment. Any work not affected by such variation shall be continued until the Architect has rendered a decision.

E. Utmost care shall be taken in erecting steel to avoid endangering the structure, construction personnel, or other personnel of the Owner or Architect, or personnel having legitimate business at the site. Location of supports for derricks, hoists, rigging or materials, shall be carefully studied by the General Contractor, and shall be reviewed by the Architect if any questions arise.

F. Flame cutting of structural steel in the field by any Contractor will not be allowed except with the written permission of the Architect.

G. Self-lubricating bearing plate assemblies shall be installed in the field. After installation, a protective covering shall be provided to insure that no dirt, or other injurious materials comes in contact with the bearing surfaces.

3.02 CONNECTIONS

A. All shop connections shall be welded unless otherwise shown on plans.

B. Field connections shall be welded where specifically shown. All other field connections shall be bolted with 3/4" minimum A307 machine bolts, except for the following, which must be made with 3/4" minimum A325 high strength bolts:
Connections of beams supporting roof mounted machinery.
Other connections as noted on the structural drawings.

C. Where bolted connections are used, they shall be standard beam connections as detailed in the AISC Manual, having a strength at least equal to one-half the tabulated load capacity of the AISC Manual.

D. Where welded connections are used, they shall be Welded Frame Beam Connections, as detailed in the AISC Manual, but of a length and capacity at least equal to that of "Minimum Beam Connections".

E. Where the combination of shop welding and field bolting is used, the appropriate portions of the bolted and welded standards specified above shall be combined.

F. High tensile bolts shall be installed in accordance with the March 1964 Specifications for Structural Joints Using ASTM A325 or A490 Bolts, approved by the Research Council of Riveted and Bolted Structural Joints of the Engineering Foundation using the Turn-of-nut method with one washer. However, bolts shall be designed as A307 bolts for all connections in which they are used.

G. Common machine bolts shall have shanks of proper length to provide full grip.

H. Provide approved lock washers to prevent slipping of nuts.

3.03 PAINTING

A. All structural steel, not encased in concrete, shall be prepared for painting according to Steel Structures Painting Council SSPC-AP3 Power Tool Cleaning and shall receive one shop coat of 1 mil. maximum, thick paint.

B. Paint, if manufacturer shop primer, shall be thinned with the building manufacturers approved material and applied at a spreading rate of 400 s.f. per gallon. The thinner shall be compatible with the finished painting materials and methods of application.

C. The Contractor shall submit the name and characteristics of proposed paint to the Architect for approval. All paint shall be used in accordance with the manufacturer's recommendations to achieve the above desired results. The prime coat shall be compatible with the finish paint.

D. After erection, all bolts, welds and serious abrasions to the shop coat shall be painted with one coat of the material used for the shop coat.

E. Steel beams and girders encased or partially encased in concrete shall not be painted where encasement occurs.

F. Steel beams and girders scheduled to receive sprayed on fireproofing shall not be painted.

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

SECTION 05210 – STEEL JOISTS

PART 1 – GENERAL

1.01 RELATED DOCUMENTS:

A. Drawings and general provisions of the Contract, including General and Supplementary conditions and Division 1 General Requirements, apply to this Section.

1.02 SUMMARY:

A. Section Includes:
   1. K-series steel joists.
   2. KCS-type K-series steel joists.
   3. K-series steel joist substitutes.
   4. Joist Girders.
   5. Joist accessories.

B. Related Requirements:
   1. Section 03300 "Cast-in-Place Concrete" for installing bearing plates in concrete.
   2. Section 04230 "Reinforced Unit masonry" for installing bearing plates in unit masonry.
   3. Section 05120 "Structural Steel" for field-welded shear connectors.

1.03 DEFINITIONS:

A. SJI's "Specifications": Steel Joist Institute's "Standard Specifications, Load Tables and Weight Tables for Steel Joists and Joist Girders."

B. Special Joists: Steel joists or joist girders requiring modification by manufacturer to support non-uniform, unequal, or special loading conditions that invalidate load tables in SJI's "Specifications."

1.04 ACTION SUBMITTALS:

A. Product Data: For each type of joist, accessory, and product.

B. Shop Drawings:
   1. Include layout, designation, number, type, location, and spacing of joists.
   2. Include joining and anchorage details; bracing, bridging, and joist accessories; splice and connection locations and details; and attachments to other construction.

1.05 INFORMATIONAL SUBMITTALS:

A. Qualification Data: For manufacturer.
B. Welding certificates.
C. Manufacturer certificates.
D. Mill Certificates: For each type of bolt.
E. Comprehensive engineering analysis of special joists signed and sealed by the qualified professional engineer responsible for its preparation.
F. Only Shop Drawings bearing the design Engineer's Review Stamp shall be used in field and all other Shop Drawings shall be considered void.

1.06 QUALITY ASSURANCE:

A. Manufacturer Qualifications: A manufacturer certified by SJI to manufacture joists complying with applicable standard specifications and load tables in SJI's "Specifications."
    1. Manufacturer's responsibilities include providing professional engineering services for designing special joists to comply with performance requirements.

B. Welding Qualifications: Qualify field-welding procedures and personnel according to AWS D1.1/D1.1M, "Structural Welding Code – Steel."

1.07 DELIVERY, STORAGE, AND HANDLING:

A. Deliver, store, and handle joists as recommended in SJI's "Specifications".
B. Protect joists from corrosion, deformation, and other damage during delivery, storage, and handling.

1.08 SEQUENCING:

A. Deliver steel bearing plates to be built into cast-in-place concrete and masonry construction.

PART 2 - PRODUCTS

2.01 PERFORMANCE REQUIREMENTS:

A. Structural Performance: Provide special joists and connections capable of withstanding design loads indicated on plans and loads due to weights of mechanical systems specified on plans.
    1. Use ASD; data are given at service-load level.
    2. Design special joists to withstand design loads with live-load deflections no greater than the following:
        a. Floor Joists: Vertical deflection of 1/360 of the span.
        b. Roof Joists: Vertical deflection of 1/240 of the span.

2.02 K-SERIES STEEL JOISTS:

A. Manufacture steel joists of type indicated according to "Standard Specification for Open Web Steel Joists, K-Series" in SJI's "Specifications," with steel-angle top- and bottom-chord members, underslung ends, and parallel top chord.
   1. Joist Type: K-series steel joists and KCS-type K-series steel joists.

B. Steel Joist Substitutes: manufacturer according to "Standard Specifications for Open Web Steel Joists, K-Series" in SJI's "Specifications," with steel-angle or-channel members.

C. Provide holes in chord members for connecting and securing other construction to joists.

D. Top-Chord Extensions: Extend top chord of joists with SJI's Type S top-chord extensions where indicated, complying with SJI's "Specifications."

E. Extended ends: Extend bearing ends of joists with SJI's Type R extended ends where indicated, complying with SJI's "Specifications".

F. Camber joists according to SJI's "Specifications".

G. Equip bearing ends of joists with manufacturer's standard beveled ends or sloped shoes if joist slope exceeds ¼ inch per 12 inches (1:48).

2.03 JOIST GIRDERS:

A. Manufacturer joist girders according to "Standard Specification for Joist Girders" in SJI's "Specifications", with steel-angle top- and bottom-chord members; with end and top-chord arrangements as follows:
   1. End Arrangement: Underslung with bottom-chord extensions.
   2. Top-Chord Arrangement: Parallel.

B. Provide holes in chord members for connecting and securing other construction to joist girders.

C. Camber joist girders according to SJI's "Specifications."

D. Equip bearing ends of joists with manufacturer's standard beveled ends or sloped sides if joist slope exceeds ¼ inch per 12 inches (1:48).

2.04 PRIMERS:

A. Primer: SSPC-Paint 15, or manufacturer's standard shop primer complying with performance requirements in SSPC-Paint 15.

2.05 JOIST ACCESSORIES:

A. Bridging: Provide bridging anchors and number of rows of horizontal or diagonal bridging of material, size, and type required by SJI's "Specifications" for type of joist, chord size, spacing, and span. Furnish additional erection bridging if required for stability.

B. Bridging: Schematically indicated. Detail and fabricate according to SJI's "Specifications". Furnish additional erection bridging if required for stability.

C. Fabricate steel bearing plates from ASTM A 36/A 36M steel with integral anchorages of sizes and thicknesses indicated.

D. Furnish ceiling extensions, either extended bottom-chord elements or a separate extension unit of enough strength to support ceiling construction. Extend ends to within ½ inch of finished wall surface unless otherwise indicated.
   1. Finish: Plain, uncoated.

E. Welding Electrodes: Comply with AWS standards.

F. Furnish miscellaneous accessories including splice plates and bolts required by joist manufacturer to complete joist assembly.

2.06 CLEANING AND SHOP PAINTING:

A. Clean and remove loose scale, heavy rust, and other foreign materials from fabricated joists and accessories by hand-tool cleaning, SSPC-SP 2 or power-tool cleaning, SSPC-SP3.

B. Do not prime paint joists and accessories to receive sprayed fire-resistive materials. UL Assemblies will not allow application of fire-resistive materials over any paint products.

C. Apply one coat of shop primer to joists and joist accessories to be primed to provide a continuous, dry paint film of not less than 1 mil thickness.

PART 3 – EXECUTION

3.01 EXAMINATION:

A. Examine supporting substrates, embedded bearing plates, and abutting structural framing for compliance with requirements for installation tolerances and other conditions affecting performance of the work.

B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.02 INSTALLATION:

A. Do not install joists until supporting construction is in place and secured.

B. Install joists and accessories plumb, square and true to line; securely fasten to supporting construction according to SJI's "Specifications", joist manufacturer's written instructions, and requirements of the Section.

C. Field weld joists to supporting steel bearing plates and framework. Coordinate welding sequence and procedure with placement of joists. Comply with AWS requirements and procedures for welding, appearance and quality of welds, and methods used in correcting welding work.

D. Bolt joists to supporting steel framework using high-strength structural bolts. Comply with RCSC's "Specification for Structural Joints Using ASTM A 325 or ASTM A 490 Bolts" for high-strength structural bolt installation and tightening requirements.

E. Install and connect bridging concurrently with joist erection, before construction loads are applied. Anchor ends of bridging lines at top and bottom if terminating at walls or beams.

3.03 FIELD QUALITY CONTROL:

A. Testing Agency: Engage a qualified testing agency to perform tests and inspections.

B. Visually inspect field welds according to AWS D1.1/D1.1M.

1. In addition to visual inspection, test field welds according to AWS D1.1/D1.1M and the following procedures, at testing agency's option:
    a. Liquid Penetrant Inspection: ASTM E 165/E 11165M.
    b. Magnetic Particle Inspection: ASTM E 709.
    c. Ultrasonic Testing: ASTM E164.
    d. Radiographic Testing: ASTM E94.

C. Visually inspect bolted connections.

D. Prepare test and inspection reports.

3.04 PROTECTION:

A. Repair damaged galvanized coatings on galvanized items with galvanized repair paint according to ASTM A 780/A 780M and manufacturer's written instructions.

B. Touchup painting: After installation, promptly clean, prepare, and prime or re-prime field connections, rust spots, and abraded surfaces of prime-painted joists, and accessories.

1. Clean and prepare surfaces by hand-tool cleaning according to SSPC-SP 2 or power-tool cleaning according to SSPC-SP 3.
2. Apply a compatible primer of same type as primer used on adjacent surfaces.
3. Any field painting beyond primer requirements will be in accordance with Section 09900- Painting.

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

SECTION 05300 - METAL DECKING

PART 1 - GENERAL

1.01 RELATED DOCUMENT

Drawings and General precision of Contract, including General and Supplementary Conditions and Division-1 Specification sections apply to work of this section.

1.02 SUMMARY

Extent of metal decking is indicated on structural drawings, including basic layout, type of deck units, gauge and thickness.

1.03 SUBMITTALS

A. Product Data: Submit manufacturer's specifications and installation instructions for each type of decking and accessories. Include manufacturer's certifications as may be required to show compliance with these specifications.

B. Shop Drawings: Submit detailed drawings showing layout and types of deck panels, anchorage details, and conditions, requiring closure panels, supplementary framing, sump pans, cant strips, cut openings, special jointing or other accessories.

C. Insurance Certification: Assist owner in preparation and submittal of roof installation acceptance certification as may be necessary in connection with fire and extended coverage insurance.

1.04 QUALITY ASSURANCE

A. Codes and standards: Comply with provisions of the following codes and standards except as otherwise indicated or specified:

AISI "Specification for the Design of Cold-Formed Steel Structural Members", 1986 with 1989 addenda. AWS D1.3 "Structural Welding Code - Sheet Steel". SDI "Design Manual for Floor Decks and Roof Decks". ASCE-7-98 for wind loads, SBC Chapter 16, SBC Sections 2204 for other requirements.

B. Qualification of Field Welding: Qualify welding processes and welding operators in accordance with "Welder Qualification" procedures of AWS D1.1.

PART 2 - PRODUCTS

2.01 MANUFACTURERS

Manufacturers: Subject to compliance with requirements, provide products of one of the following:

METAL ROOF DECK UNITS:
Bowman/E.G. Smith, Div. Cyclops Corp.
Consolidated Systems, Inc.
Epid Metals Corp.
Mac-Fab Products, Inc.
Marlyn Steel Decks, Inc., Tampa
Roll Form Products, Inc.
United Steel Deck, Inc.
Wheeling Corrugating Co.
Wolverine Deck Co.

2.02 MATERIALS

A. Steel for Galvanized Metal Deck Units: ASTM A 446, Grade A

B. Miscellaneous Steel Shapes: ASTM A 36.

C. Sheet Metal Accessories: ASTM A 526, commercial quality, galvanized.

D. Galvanizing Repair Paint: High zinc-dust content paint for repair of damaged galvanized surfaces complying with Military Specifications MIL-P-21035 (Ships).

E. Flexible Closure Strips: Manufacturer's standard vulcanized, closed-cell, synthetic rubber.

PART 3 - EXECUTION

3.01 INSTALLATION

A. General: Install deck units and accessories in accordance with manufacturer's recommendations and final shop drawings, and as specified herein.

B. Place deck units or supporting steel framework and adjust to final position with ends accurately aligned and bearing on supporting members before being permanently fastened. Do not stretch or contact side lap interlocks.

C. Place deck units in straight alignment for entire length of run of cells and with close alignment between cells at ends of abutting units.

D. Place deck units flat and square, secured to adjacent framing without warp or excessive deflection.

E. Do not place deck units on concrete supporting structure until concrete has cured and is dry.

F. Coordinate and cooperate with structural steel erector in locking deck bundles to prevent overloading of structural members.

G. Do not use floor deck units for storage working platforms until permanently secured.

3.02 FASTENING DECK UNITS

A. Positive attachment of structural sheets to steel roof joists shall be not less frequently than the following maximum spacings.

1. One fastener shall be placed near the corner of each sheet or at overlapping corners of sheets.
2. Along each supporting member, the spacing of fasteners shall not exceed eight inches on centers at ends of sheets nor twelve inches on centers at intermediate supports.
3. The spacing of edge fasteners between panels and supporting members, parallel to the direction of span, where continuous interlock is not otherwise provided shall be not more than 12" on center.
4. The periphery edges of metal decks shall be fastened to resist uplift in special end, edge and corner zones.

B. Fastening patterns must consider eave and corner areas to insure that fasteners will safely resist the required wind uplift. See ASCE 7-98, Importance factor 1.15. Design wind speed shall be in accordance with ASCE FIGURE 6-1b Basic Wind Speed Map.

C. The fusion welding of structural sheets shall be through weld washers not less than 14 gage in thickness and 1" in diameter, contoured if necessary to provide continuous contact.

3.03 ROOF Z-SUBGIRT ATTACHMENT:

A. Positive attachment of 6", 14 gage Z-sections thru structural sheets, to structural steel support members shall be provided by 2" long carbon steel AB point #14 Hex Head self-tapping screws, spacing shall not be more than 48" on center.

B. Comply with AWS requirements and procedures for manual shielded metal arc welding, appearance and quality of welds, and methods used in correcting welding work.

C. Cutting and Fitting: Cut and neatly fir deck units and accessories around other work projecting through or adjacent to the decking, as shown.

D. Reinforcement at Openings: Provide additional metal reinforcement and closure pieces as required for strength, continuity of decking and support of other work

shown.

E. Hanger Slots or Clips: Provide UL approved punched hanger slots between cells or flutes of lower element where floor deck units are to receive hangers for support of ceiling construction, air ducts, diffusers, or lighting fixtures. Hanger clips designed to clip over male side lap joints of floor deck units may be used instead of hanger slots. Locate slops or clips at not more than 14" o.c. in both directions, not over 9" from walls at ends, and not more than 12" from walls at sides, unless otherwise shown.

F. Roof Sump Pans: Place over openings provided in roof decking and weld to top decking surface. Space welds not more than 12" o.c. with at least one weld at each corner. Cut opening in roof sump bottom to accommodate drain size indicated.

G. Closure Strips: Provide metal closure strips at open uncovered ends and edges of roof decking and other construction. Weld into position to provide a complete decking installation.

H. Tough-Up Painting: After decking installation, wire brush, clean and paint scarred areas, welds, and rust spots on top and bottom surfaces of decking units and supporting steel members. Tough-up galvanized surfaces with galvanizing repair paint applied in accordance with manufacturer's instructions. In areas where shop-painting surfaces are to be exposed, apply tough-up paint to blend into adjacent surfaces.

I. Tough-Up-Painting: Clean and touch-up painting of field welds, abraded areas and rust spots, as required after erection and before proceeding with field painting, is included in Division 9 under Painting.

*****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 05500 - MISCELLANEOUS METALS

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

The Bidding and Contract Documents, General Requirements and Addenda, as may be issued prior to bidding, shall govern the work under this Section.

1.02 SCOPE OF THE WORK

A. Provide all labor, materials, necessary equipment and service, to complete the miscellaneous metals work and related work, as indicated on the drawings, as specified herein or both, except for items specifically indicated as "NOT IN CONTRACT" (NIC).

B. Including, but not necessarily limited to the following:

1. Roof opening framing - (Roof Drains, Roof Curbs, Roof Scuttles, Vent Fans, Exhaust Fans).
2. Miscellaneous anchors and fastenings.
3. Piping, RWL, Chilled Water Line (Supports for hangers).
4. Steel & Alum. ladders to Scuttles & Mezzanines.
5. Miscellaneous Angles.
6. Louver Door Security Panels.
7. Safety Nosings.
8. Masonry Openings for Exhaust Fans.
9. Folding Door Support Framing.
10. Recessed Ceiling Framing Supports.
11. Shop Coat Painting of All Items.

1.03 WORK OF OTHER SECTION

A. Structural Steel	Section 05120
B. Painting	Section 09900
C. Mechanical	Division 15

1.04 SAMPLES, SUBMITTALS AND SHOP DRAWINGS

A. This list consists of samples, submittals and shop drawings which require submission by the Contractor to the Consultant for approval.

B. Any omission of items which require the Contractor's compliance under the contract Documents does not relieve said Contractor from such responsibility.

C. Submit samples, submittals and shop drawings as required or requested by the Architect/Engineer whether included in this list or not, and as requested on the drawings.

D. Submittals and shop drawings shall be submitted as (4) four copies, notarized and signed by an officer of the company and shall state the required information explicitly and specifically. Submit shop drawings for all fabricated items in accordance with Contract Conditions, plus plan locations.

E. Coordinate roof framing opening supports with Steel Joists Shop Drawings. Submit steel Joist and Miscellaneous Metal Shop Drawings as prescribed.

1.05 QUALITY STANDARDS

Conform to applicable portions of the following:
A. American Institute of Steel Construction (A.I.S.C.)
B. American Welding Society (A.W.S.)

PART 2 - PRODUCTS

2.01 BASIC MATERIALS

Refer to Drawings for locations of each material use and type. Some or all of these materials may be utilized on each project.

A. Steel shapes - ASTM A-50
B. Steel pipe -ASTM A-50, galvanized where called for on plans.
C. Bolts - ASTM A-325, galvanized for exterior use, and where called for on plans.
D. All exterior steel items to be hot dipped galvanized.
E. Aluminum pipe - ASTM B 221 for 6063-T6.
F. Stainless Steel plate, angles and fabricated hangers, Grade 304 where concealed from weather, and Grade 316 where exposed to weather.

2.02 STEEL & ALUMINUM LADDERS

A. Fabricate to size and detail, with welded joints dressed smooth.

B. Erect ladders as indicated, securely fastened to structure.

C. Steel ladders to be hot dipped galvanized after fabrication in accordance with ASTM A-123-59T.

2.03 FASTENERS

A. General: Provide stainless steel fasteners for exterior use and zinc-coated fasteners where built into exterior walls where fasteners are not exposed. Select fasteners for

the type, grade and class required.

B. Bolts and Nuts: Regular hexagon head type, ASTM A307, Grade A.

C. Lag Bolts: Square head type, FS FF-B-561.

D. Machine Screws: Cadmium plated steel, FS FF-S-92.

E. Wood Screws: Flat head carbon steel, FS FF-S-111.

F. Plain Washers: Round, carbon steel, FS FF-W-92.

G. Masonry Anchorage Devices: Expansion shields, FS FF-S-325.

H. Toggle Bolts: Tumble-wing type, FS FF-B-588, type, class and style as required.

I. Lock Washers: Helical spring type carbon steel, FS FF-W-84.

2.04 ROUGH HARDWARE

A. Fabricate bent or otherwise custom fabricated bolts, plates, anchors, hangers, dowels and other miscellaneous steel and iron shapes as required for framing and supporting woodwork, and for anchoring securing woodwork to concrete or other structures. Provide straight bolts and other stock rough hardware items as specified on the drawings.

B. Manufacture or fabricate items of sizes, shapes and dimensions required. Furnish malleable iron washers for heads and nuts which bear on wood structural connections; elsewhere, furnish steel washers.

2.05 MISCELLANEOUS

A. Fabricate all steel headers, angles, channels, ladders, steel shapes, inserts, anchors, brackets, support framing, as indicated and/or detailed on plans.

2.07 SHOP COAT PAINT

A. Apply red oxide shop coat paint to all ferrous metal.

B. Apply shop touch-up zinc based paint to all galvanized metals after installation.

C. Aluminum products to be mill finish unless called out otherwise on the drawings.

D. Apply specialty coatings as called for on the drawings.

*****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 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:

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 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 07320 - CONCRETE ROOFING TILES - MECHANICALLY FASTENED

PART 1 - GENERAL

1.01 RELATED WORK SPECIFIED ELSEWHERE

A.	Rough carpentry	Section 06100
B.	Roof and deck insulation	Section 07220
C.	Flashing and sheet metal	Section 07600
D.	Fabricated Roof Specialties	Section 07700

1.02 QUALITY ASSURANCE

A. Requirements of regulatory agencies.

1. Standard Building Code Congress International Standards for the Installation of Roof Coverings 1988 Edition.

B. Roofing shall be installed by a Roofing Contractor approved, in writing, by the roofing material manufacturer.

1.03 SUBMITTALS

A. Samples - tile type and color as selected.

B. Manufacturer's literature - including product descriptions and recommended installation procedures.

1.04 PRODUCT DELIVERY, STORAGE AND HANDLING.

A. Distribute stacks of tile uniformly, not in concentrated loads.

1.05 JOB CONDITIONS

A. Do not install underlayment or tiles on wet, frozen, or icy surfaces.

B. Insure other trades are aware of precautions required when trafficking, (walking) on tile, and their responsibility for protection of tile during and upon completion.

1.06 WARRANTY

A. Materials- manufacturer's limited warranty against defects in roof tile for 20 years.

1.07 GUARANTEE

A. Materials and Workmanship- roofing contractors written guarantee, to the Owner,

against defects in materials and workmanship for 3 years.

PART 2 - PRODUCTS

2.01 ROOF TILES TO BE MANUFACTURED BY A MEMBER OF THE NATIONAL TILE ROOFING MANUFACTURING ASSOCIATION/FLORIDA CHAPTER:

A. Approved Tile Manufacturers: MONIER, BENDER, PIONEER, ETERNA, RE-CON BUILDING PRODUCTS or LIFETILE.

B. Tile Type: Slate.

C. Accessory Tile Type: Ridge cap only; all hips and rakes shall be mitered cut.

D. Surface Finish: Smooth to lightly brushed Finish.

E. Color: White - (Manufacturer's Standard Color)

F. Approximate Weight: 10 pounds.

G. Minimum Headlap: 3 inches or as per manuf. spec.

H. Meet or exceed waterproof requirements of S.B.C.C.I. and/or S.F.B.C., and/or U.B.C Standard 32-12 for absorption and permeability.

I. Meet or exceed minimum: S.B.C.C.I. and/or S.F.B.C., and/or U.B.C. break strength requirement

J. Meet or exceed standards of A.S.T.M. C-666 for freeze thaw requirements.

2.02 ASPHALT - SATURATED ROOFING UNDERLAYMENTS

A. Single-ply self-sealing modified roofing system.

NOTE: For minimum underlayment requirements, refer to manufacturer recommendations and local codes.

1. 74# mineral surface roll roofing felt commonly called 90#, cold adhesive applied. Conforming to A.S.T.M. D-249. Self-sealing.

2.03 MEMBRANES

A. Organic

1. Conforming to A.S.T.M. D-173, asphalt impregnated cotton membrane, minimum 3"wide.

B. Inorganic

1. Conforming to A.S.T.M. D-1668, asphalt impregnated fiberglass membrane, minimum 3" wide.

2.04 FASTENERS (LOCAL CODES PREVAIL)

A. Nails - corrosion resistant stainless steel ring shank of sufficient length to properly penetrate deck minimum 3/4" or through thickness of deck, whichever is less.

1. Roofing felt application.
   a. Standard application - minimum lap 3".
   b. Exposed ceilings - refer to local codes.

2. Tile application - refer to manufacturer's recommendations.

B. Cap nails.

C. Staples - No staples will be accepted.

D. Tin-tags- not less than 1-5/8" nor more than 2" in diameter and minimum 32 gauge sheet metal.

E. Storm clips - refer to manufacturer recommendations, Architectural Drawings and the Florida Building Code 2001Edition, for placement at perimeters and field. **For this project, each perimeter tile and every third field tile shall receive a storm clip.**

2.05 METAL FLASHING

A. Flashing to be minimum 26-gauge copper, g-90 corrosion resistant metal - conforming to A.S.T.M. A-525 and A-90 or approved equal. (Refer to local codes.)

2.06 ADHESIVE/SEALANT

A. Asphalt plastic roof cement: conforming to A.S.T.M. c-2822, Type II. Nonrunning, heavy body material composed of asphalt and other mineral ingredients.

A. Cold process liquid roof coating: conforming to A.S.T.M. D-3019, Type II.

B. Structural bonding adhesive: conforming to A.S.T.M. C-557 or A.S.T.M. D-3498

C. Hot steep asphalt: conforming to A.S.T.M. D-312.

2.07 MORTAR

A. Materials:

1. Cements:

   a. Blended cement - conforming to A.S.T.M. C-91, Type M.
   b. Portland cement - conforming to A.S.T.M. C-150, Type I.
   c. Masonry cement - conforming to A.S.T.M. C-91, Type M.

2. Sand - conforming to A.S.T.M. C-144, uniformly graded, clean and free from organic materials.

B. Mixes: conforming to A.S.T.M. C-270, Type "M" mortar.

   1. Cement 2.07 A-1-a.

C. Mortar flow 110 + or - 5% conforming to A.S.T.M. C-230 flow table.

2.08 EAVE CLOSURE (PER MANUFACTURER RECOMMENDATIONS)

A. Prefabricated EPDM synthetic rubber conforming to A.S.T.M. C-1056.

B. Prefabricated minimum 26gauge corrosion resistant metal eave closure.

C. Mortar (color optional) for mineral surface roll roofing.

2.09 LUMBER

NOTE: Fire-retardant treated material may require special consideration and special fasteners.

A. Sheathing - material to conform to APA minimum standards or local code approved equal.

B. Nailer board - pressure treated in accordance to local code requirements.

PART 3 - EXECUTION

3.01 INSPECTION

A. Verify that surfaces to receive underlayment and roof tile are uniform, smooth, clean, and dry.

B. Do not start roofing, installation until general contractor and/or local building department has inspected and approved the nail pattern for decking installation.

3.02 SUB-ROOF APPLICATION

A. NOTE: A 30# dry-in sheet is to be installed prior to 3.02 sub-roof application.

1. Eave drop metal.

NOTE: Securement of drip edge may be decreased when additional securement will be used during application of underlayment, and/or metal/rubber eave closure.

a. Nail drip edge metal along and directly on top of sheathing. Fasten 6" on center and ½" in from top flange. Lap all joints minimum 3".

b. Seal along entire length of top edge of eave drop with plastic cement.

2. Underlayment.

a. Apply a 36" wide strip of underlayment (sweat sheet) down center of valley.

b. Tin-tag and secure underpayment with either nail, or cap nail maximum 24" on center along edge of sheet.

c. Start at eave edge and apply on course of underlayment horizontally along roof line. Lap end joints minimum 6". Seal and lap with plastic cement.

d. Ting-tag and secure underlayment with either nails, or cap nails approximately 12" on center along top edge of sheet.

e. Seal along entire length of top edge of underlayment. Covering all tin-tags or cap nails with plastic cement.

f. Apply each succeeding course in same manner allowing minimum 2" headlap.

NOTE: Optional - Under windy conditions it may be necessary to tin-tag and secure with nails, or cap nails approximately 3' on center at overlap.

g. Insure weave pattern at all valleys.

h. Overlap all hip and ridge minimum 6".

i. Trim underlayment at all wall bases.

2. Gable drop edge metal.

a. Nail or staple drop edge metal along and directly on top of underlayment. Fasten 6" on center and ½" in from top flange. Lap all joints minimum 3".

b. Continue from eave up rake/gable, insuring water shedding capabilities of all metal laps.

3. Valleys.

NOTE: Where special conditions exist, it may be necessary to increase the width of valley metal.

a. Preformed.
    i. Install preformed closed valley minimum 16" width with minimum 2-1/2" high center diverter.

b. Nail within 1" of metal edge maximum 6" on center.

c. Lap metal joints minimum 6". Apply plastic roof cement between laps. Extend beyond fascia as required.

d. Seal along entire edge of metal flange, covering all nail penetrations with plastic cement and membrane.

4. Flashings and counter flashings at wall abutments.

a. Install "L" metal flashings flush to base of walls over underlayment and nail within 1" of metal edge. Nail horizontal flange 6" on center, secure vertical flange as necessary to satisfy job conditions. Lap joints approximately 4" and apply plastic roof cement between laps. Start at lower portion and work up roof to insure water shedding capabilities of all metal laps.

b. Seal along entire edge of metal flange, covering all nail penetrations with plastic roof cement and membrane.

c. When installing optional counter flashing, lap top flange of base flashing minimum 3". Nail metal within 1" of metal edge minimum 86" on center or set into reglets (secured properly) and thoroughly caulk. Lap joints minimum 3" and apply plastic roof cement between laps.

NOTE: It is recommended that all head/apron flashing to be installed on top of the underlayment conforms to the pitch of the roof and extend minimum 4" on deck. Seal metal edge with plastic cement and membrane.

5. Standard skylights, chimneys, etc. Install in accordance with regular flashing installation procedures. Refer to Section 3.02 (.2) A.5.

6. Pipes, vents, etc.

a. Apply plastic roof cement around base of protrusion and on bottom side of

metal flanges sealing unit base flashing to underlayment.

b. Nail and secure all sides of bas flashing within 1" from edge. Make certain base is flush to deck.

c. Seal along edge of metal flanges, covering all nail penetrations with plastic roof cement and membrane.

3.02 (.3) SUB-ROOF APPLICATION (COMMONLY CALLED 30/90 HOT MOP)

NOTE: This system utilizes standard metal flashings, minimum 30# dry-in sheet, tin-tagged, hot mopped or cold adhesive applied minimum 74# mineral surfaced roll roofing, and a minimum 2" tile headlap. Apply plastic cement at all nail penetrations. For pitches 6/12 and above, plastic cement may be eliminated.

A. Two-ply underlayment- pitches 3/12 and greater (refer to local building codes for minimum).

1. Base Ply

a. Start at eave edge and apply one course of Type 30 roofing felt horizontally along roof line. Lap end joints minimum 4".

b. Tin-tag and secure Type 30 felt with either nails, or cap nails maximum 12" on all headlaps. (refer to local code requirements).

c. Insure weave pattern at all valleys.

d. Apply each succeeding course in same manner allowing minimum 2" headlap.

e. Overlap all hip and ridge minimum 6".

2. Drip Edge Metal

a. Nail or staple drop edge metal along and directly on top of Type 30 felt at eave. Fasten 6" on center and ½" in from top flange. Lap all joints minimum 3".

b. Continue from eave up rake/gable in same manner, insuring water shedding capabilities of all metal laps.

3. Valleys

a. Preformed. Install preformed closed valley minimum 16" width with minimum 2-1/2" high center diverter.

b. Nail within 1" of metal edges maximum 6" on center.

c. Lap metal joints 6" minimum. Apply plastic roof cement between laps. Extent beyond fascia s required.

4. Flashing and counter flashings at wall abutments.

a. Install "L" metal flush to base of walls over Type 30 felt and nail within 1" of metal edges. Lap joints 4" and apply plastic roof cement between laps. Start at lower portion and work up to insure water tightness.

b. Seal along top edge of vertical flange, covering all nail penetrations with plastic roof cement and membrane where required by local codes.

c. When installing optional counter flashing lap top flange of base flashing minimum 3". Nail metal within 1" of metal edge minimum 6" on center or set into reglets (secured properly) and thoroughly caulk. Lap joints minimum 3" and apply plastic roof cement between laps.

NOTE: It is recommended that all head/apron flashing to be installed on top of the mineral surface roll roofing. Insure the deck flange conforms to the pitch of the roof and extend minimum 4" on deck. When local codes require the head/apron flashing to be installed between plies of felt, seal edge of No. 90 felt with plastic cement and membrane.

5. Standard skylights, chimneys, etc, -install in accordance with regular flashing installation procedures. Refer to section 3.02 (.3) A-4.

6. Pipes, vents, etc.

a. Apply plastic roof cement around base of protrusion and on bottom side of metal flanges sealing unit base flashing to deck.

b. Nail and secure all sides of base flashing within 1" from edge. Make certain base is flush to deck.

7. Top-ply

a. Start at eave edge and apply No. 90 roll roofing horizontally along roof line over base ply lapping and joints minimum 6". Apply hot asphalt or approved equal between plies of roofing felt so that no felt touches felt. Back nail using tin-tags and roofing nails or cap nails or cap nails maximum 12" on center approximately 1" from top edge of felt.

b. Apply each succeeding course in same manner, allowing minimum 2" headlap.

c. Overlap hip and ridge minimum 6".

d. Insure weave pattern in valley or trim maximum 4" past nail penetrations. When using preformed valley metal seal edge of No. 90 felt with plastic roof cement and membrane.

e. Hot mop or cold process all metal flashings and roof protrusions in order to insure weather tightness. Do not hot mop over plastic roof cement.

f. Trim any felt overhang at eave and gable.

g. Cut any fishmouths and seal with plastic roof cement and membrane.

h. Apply plastic roof cement or hot asphalt along edge of felt wherever it meets wall bases.

8. Two-ply underlayment for pitches above 6/12. Cold process or plastic roof cement may be substituted for hot asphalt.

3.03 LOW PROFILE, HIGH PROFILE AND FLAT TILE INSTALLATION

NOTE: The following recommendations apply for direct deck and batten installations. For specific batten installation, refer to 3.03C.

A. Layout - horizontal

1. Chalk horizontal lines beginning one tile length from eave less desired overhang. Overhang should be 3/4" to 2" depending on tile type, use gutters, or other functional requirements.

2. For batten installation only, chalk horizontal line 1-1/2" from ridge.

3. Chalk succeeding lines to accommodate underlayment system and/or manufacturer recommendations.

4. Increase headlap when necessary for equal course spacing.

B. Layout - vertical.

1. Straight bond - not recommended for flat tile.

a. Gable end.

i. Chalk vertical line one full tile width plus 1" to 2" from starting gable.

ii. Chalk additional lines, if necessary, to maintain alignment.

b. Hip roof.

i. Chalk vertical line 90 degrees from eave line.
ii. Chalk additional lines, if necessary, to maintain alignment.

C. Batten installation.

NOTE: battens are optional up to 7/12 pitch. Refer to manufacturer recommendations for pitches 7/12 and greater. For pitches below 6/12 use 4 foot battens or shim with moisture resistant 1/4" nominal lath or strips of decay resistant material, such as asphalt cap sheet or asphalt shingle. When using battens with the sealed underlayment system apply plastic cement at all nail penetrations.

1. Install top edge of batten to horizontal line.

2. Fasten and secure maximum 24" on center, minimum 6d corrosion resistant nail. See manufacturer recommendation.

3. Leave ½" space between batten ends and between batten and metal edges.

D. Tile installation.

1. Stack tile to facilitate installation and minimize tile movement.

2. Eave treatment.

a. Prefabricated eave closure - install closure strip along eave according to manufacturer recommendations.

b. Storm clips - refer to manufacturer recommendations and detail drawings.

c. Other - see manufacturer recommendations.

3. Low profile, high profile, and flat tile.

NOTE: Apply plastic cement at all nail penetrations when utilizing a 2" tile head lap except for pitches 6/12 and greater.

a. Starting at lower left hand corner (facing down roof) install first course of tile. Make certain that all tile overhangs drip edge evenly along entire course.

b. Fasten tile according to manufacturer recommendations.

c. Cut/break tile for proper staggering of tile courses when using the staggered/cross bond method of installation.

d. Set tile in stepped course fashion or in a horizontal and/or vertical fashion when utilizing straight bond method.

e. Lay succeeding courses of field tile in same manner.

f. Fasten according to manufacturer recommendations.

g. Cut/break field tile to form straight edge at center of hip/ridge.

4. Valleys.

NOTE: It is not recommended to install trim tile in valleys. It may be necessary to remove the lugs from the field tile at wall and valley flashings for proper positioning of cut field tiles.

a. Closed valley.

i. Miter tile to meet at center of valley.
ii. Miter tile to form straight border on either side of water diverter.

5. Hip and ridge.

a. Prefabricated hip starter.
i. Use standard hip tiles as starter.

b. Set hip and ridge tiles in a continuous bed of mortar, lapping tile minimum 2". Insure bed of mortar does not protrude in center of hip or ridge junction. Approximately 1" of field tile should extend beyond bed of mortar. Apply sealant between laps at ridge only. Point mortar and finish to match tile surface. Apply weep holes flush with field tile at ridge only.

6. Nailer boards. (See manufacturer recommendations).

a. Install pressure treated nailer boards where required for steep roof pitch installation for use with hip/ridge.

b. Fasten with corrosion resistant nails of sufficient length to penetrate 3/4" or through deck, whichever is less.

7. Rake/gable tile.

a. Install first rake tile to the exposed length of the first course of field tile. Install factory finish of tile toward eave.

b. Nail rake tile with minimum of two ring shank stainless steel nails of sufficient length to penetrate framing minimum 3/4".

c. Abut each succeeding rake tile to nose of field tile above and maintain constant headlap.

8. Rake/gable flush finish.

a. Mortar finish.
   i. Place color coordinated mortar bed along roof edge.
   ii. Point smooth to a straight edge finish.

NOTE: Rake tile application at finishing end may need special consideration to provide proper drainage. i.e.: Flashing or sealants may be needed. Refer to manufacturer recommendations.

9. Wall abutments.

Cut tile to fit approximately 3/4" to base of walls. Point-up mortar not recommended.

NOTE: It may be necessary to remove the lugs from the filed tile at wall flashing for proper positioning of cut field tiles.

10. Plumbing stacks.

Cut tile to fit close to plumbing stack, fill void with color coordinated mortar and point to match tile surface when using underlayment system 3.02(.2), see Section 3.02(.2) A-10.

11. Coatings - optional

a. Acrylic sealer - Apply to exposed mortar as per manufacturer recommendations.

b. Paint - Apply color-coordinated paint to all metal flashings.

12. Tile replacement.

a. Damaged tile:

   i. Break out and replace damaged roof tile. Do not disturb underlayment. Repair underlayment if necessary.
   ii. When battens are used, drive nail flush to batten with hammer and flat bar.

iii. Apply minimum 1 square inch of approved adhesive on tile in course below replacement tile.
iv. Immediately set replacement tile in position assuring proper contact.

b. Small valley and hip cuts.
   i. Elevate nose end of tile in course above small cut tile, apply a minimum 3/8" bead of approved adhesive at head of cut tile.
   ii. Immediately set tile in course above in position assuring proper contact.

NOTE: For pitches 8/12 and above, mechanically fastening may be required. Refer to manufacturers requirements

13. Clean-up - Remove broken tile, debris and excess tile from roof.

14. Miscellaneous recommendations.

Instructions should be given to all parties involved cautioning against traffic of any kind allowed on finished roof. Damage to roof tiles and/or sub-roof may result. Refer to manufacturer's recommendations for proper procedures for trafficking roof tile.

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

SECTION 07516 – FULLY ADHERED SINGLE PLY ROOFING SYSTEM

PART 1 - GENERAL

1.01 DESCRIPTION

A. Scope
Furnish and install membrane roofing, by adhering a FiberTite, E.I.P. Roofing System as manufactured and supplied by:

Seaman Corporation,
1000 Venture Blvd., Wooster, Ohio 44691
Telephone: 1-800-927-8578
Fax: 1-800-649-2737

B. Special Conditions

1. This specification is to be applied, without variation, to only those building roofs having deck structures capable of supporting the guidelines set forth herein.
2. All applications require review by the FiberTite Technical Customer Services (FTCS) before any modification of this specification is valid.
3. Seaman Corporation Warranty Request Form (FTR-WRF), must be completed, signed by appropriate parties, submitted to and approved by FTCS before any consideration for warranty and/or the release of any materials can be authorized.

C. Special Design Considerations

1. An engineering study, indicating that the structure is unable to accommodate additional live and/or dead loads.
2. Mechanical fastener withdrawal resistance tests must be conducted as a means of determining the deck acceptability for proper mechanical attachment of roof insulation, base sheet and/or FiberTite Membrane when necessary.
3. Moisture conditions in existing roof(s) which would prohibit a successful recover.
4. Roof areas subject to heavy or excessive mechanical traffic.
5. Positive slope to insure adequate drainage and no ponding water within 48 hours of each rain occurrence.

D. Environmental Considerations

1. Severe environmental exposure, e.g. coastal or high wind area(s), which may require enhanced mechanical attachment.
2. Chemical discharge not listed on the Seaman / FiberTite chemical resistance publication.
3. Do not apply adhesives in conditions such as fog, dew, rain or snow, or when frost occurs on the surfaces of the membrane or substrate.

4. Do not use FTR-390 (water based) emulsion adhesive if the ambient air temperature is expected to drop below 32¡F (0¡C) within 24 hours of application.
5. Compliance with EPA and OSHA requirements as published by local, state and Federal authorities.

1.02 QUALITY ASSURANCE

A. FiberTite Roofing System shall be installed only by a roofing contractor, authorized by Seaman Corporation (herein after referred to as Seaman) prior to bid and/or contract award.
B. Roofing contractor's key personnel shall have been trained by Seaman.
C. FiberTite Roofing System shall be installed in accordance with current specifications and details as amended and/or authorized by FTCS.
D. There shall be no deviations from approved contract specifications or shop drawings without prior written approval by the owner/owner's representative and FTCS.
E. Unauthorized deviations may subject the roof system to warranty ineligibility.
F. Upon completion and certification by the contractor that a quality installation has been completed in accordance with the contract specifications, a quality assurance inspection of the roof system shall be performed by FTCS for acceptance and approval of appropriate warranty.

1.03 SUBMITTALS

A. The following information shall be submitted to FTCS for review before warranty consideration or acceptance can be confirmed.

1. Complete copy of project architectural specifications or authorized applicator's proposal outlining design parameters.
2. Complete list of accessories or materials not manufactured or expressly authorized for use in FiberTite literature.
3. Dimensioned outline of the roof indicating all FTR-Detail references.
4. Dimensioned shop drawings illustrating non-FiberTite details. Details that do not conform with standard FiberTite details shall be returned with appropriate recommendations.

B. At the time of contract award, the authorized roofing contractor shall submit to the owner/owner's representative the following:

1. Most recent published technical literature and specifications issued by FTCS.
2. Sample warranty and letter from Seaman, authorizing the roofing contractor.
3. Roofing Contractor's approved copy of submittal form FTR-WRF.
4. Dimensioned shop drawings, including roof plan detailing perimeter enhancement, flashing methods, terminations and acceptance by FTCS.
5. Written approval by the insulation manufacturer for the use and suitability of their product(s) in the proposed system.

6. Written approval from FTCS confirming any accessories submitted, not manufactured or expressly approved in FiberTite literature are acceptable and compatible with the proposed FiberTite Roofing System.
7. Material Safety Data Sheets (MSDS) relating to all products, chemicals and solvents.
8. Certification that the system specified complies with all identifiable building code and insurance requirements.

1.04 DELIVERY & STORAGE

A. Deliver all materials to the jobsite in manufacturer's original, unopened containers with legible labels and in sufficient quantity to allow for continuity of work.
B. Select and operate material handling equipment in a safe manner, guarding against damage to existing construction or newly applied roofing and conforming to manufacturer's recommendations of handling and storage.
C. All rolls of membrane shall be stored, lying down, elevated above the roof deck and completely protected from moisture with tarpaulins. (The polyethylene wrappers on the rolls do not provide adequate moisture protection during roof-top storage.)
D. Insulation shall be stored on pallets, fully protected from moisture with tarpaulins. (Manufacturer's packaging is not considered adequate protection from moisture.)
E. Adhesives shall be safely stored, at temperatures above 40¡F.
F. Flammable materials shall be stored in a cool, dry area away from sparks and open flames. Follow all precautions as outlined in manufacturer's Material Safety Data Sheets.
G. Materials, having been determined by the owner/owner's representative to be damaged, shall be immediately removed from the construction site and replaced at no cost to the owner.

1.05 JOB CONDITIONS

A. Safety

1. Take all necessary precautions regarding worker health and safety when using solvents and adhesives.
2. Store flammable liquid and materials away from open sparks, flames and extreme heat.
3. Take necessary precautions when using solvents and adhesives near fresh air intakes.
4. Comply with all OSHA requirements for construction.
5. Daily site cleanup shall be performed to minimize debris and hazardous congestion.

B. Protection

1. Schedule installation sequence to limit access and utilization of the newly installed membrane for material storage, construction staging, mechanical and/or excessive foot traffic.
2. Provide proper protection on newly completed roofing.
3. Protect building walls, rooftop units, windows and other vulnerable components during installation.

C. Additional Precautions

1. Daily production schedules of new roofing shall be limited to only that which can be made 100% watertight at the end of the day, including all flashing and night seals.
2. All surfaces to receive new roof system, including insulation and flashing, shall be free from all dirt debris and be thoroughly dry.
3. Adverse weather conditions, e.g. extreme temperature, high humidity, high winds and moisture, may affect adhesive application and the overall quality of the installation. Contact FTCS for acceptable tolerances.
4. Comply with local EPA requirements as published by Local, State and Federal authorities.
5. All construction debris shall be removed from the construction site and legally disposed of off-site.

1.06 COORDINATION

A. Prior to installation of materials, a pre-roofing conference will be held with the authorized roofing contractor, Seaman representative and owner/owner's representative(s) to discuss the specified roofing system, its proper application and the expectations of all parties involved. The authorized roofing contractor and the owner/owner's representative shall notify all parties a minimum of seven days prior to the meeting.
B. Plan and coordinate the installation of the new roofing system with other trades in such a manner to avoid membrane damage, keeping the complete installation weather-tight and in accordance with all approved details and warranty requirements.
C. FiberTite Technical Customer Services shall be available to make recommendations necessary to insure compliance with project specifications and shall be responsible for recommending any specification alternatives due to unforeseen job conditions.

1.07 WARRANTY

A. Inspections
A FiberTite Technical Customer Service Representative shall inspect the completed FiberTite Roofing System, and upon acceptance, Seaman shall issue the specified warranty, subject to the terms and conditions of the sample warranty and contract documents.

B. Available Warranties
Seaman Corporation offers the following FiberTite Roofing System warranties:

1. Material Warranty provides the building owner protection against the cost of repairing defects in the membrane only. This warranty is offered at no cost to the owner.
2. Warranty shall provide the building owner protection against the cost of repairing leaks as a direct result of either defects in the membrane or the workmanship involved in its installation for a period of twenty **(20) years. There is an additional premium.**

C. Maintenance
Along with the issuance of the warranty, a set of instructions shall be included detailing preventative maintenance and noting a list of harmful substances which may damage the roofing membrane.

PART 2 – PRODUCTS

2.01 GENERAL

A. All products and components for the adhered FiberTite Roofing System shall be supplied by Seaman.
B. Components other than those manufactured and/ or supplied by Seaman shall be submitted for review, prior to ordering. Any product(s) not specifically authorized in writing for the project by Seaman shall be considered unacceptable and their performance excluded from the warranty.

2.02 MEMBRANE

A. Approved Membrane

Roofing membrane shall be nominal **0.080** inch thick ethylene interpolymer (EIP) alloy, reinforced with knitted polyester fabric as manufactured by Seaman Corporation, under the trade name FiberTite or FiberTite-XT respectively, conforming to the following physical properties as outlined in Table 1 of this specification.

B. Flashing Membrane
Nominal **0.045** inch FiberTite or **0.080** inch FiberTite-XT shall be used for all membrane and flashing requirements.

C. FiberTite membrane may be adhered directly to pre-approved insulation, cover board or base sheet. Contact FTCS for additional information regarding compatible substrates with sufficient adhesion properties.

Table 1: Physical Properties of FiberTite & FiberTite-XT Membrane

MATERIAL PROPERTY	TEST METHOD (s)	PRODUCT DATA		
		FiberTite		FiberTite-XT
Fabric - Type	ASTM D 751	Polyester		Polyester
- Weight		(oz)	5.0	6.5
Thickness (nominal)	ASTM D 751	(inches)	0.036	0.045
Breaking Strength	ASTM D 751	Grab (lbs)	375 x 350	550 x 500

Tensile Strength	ASTM D 882 (psi)	8500	9500
Elongation	ASTM D 751 (%)	20 x 30	20 x 30
Seam Strength of Breaking Strength	ASTM D 751 Grab (%)	100	100
Tear Strength	ASTM D 751 (lbs)	100	125
Puncture Resistance	Fed. Std. 101B / (lbs)	250	300
Dynamic Puncture	ASTM D 5635 J)	15	23
	(ft - lbf)	11.06	16.96
Static Puncture	ASTM D 5602 (33 lbf)	Pass	Pass
Water Vapor Transmission (gm/m2/24hrs)	ASTM E 96 Proc. A	1.3	1.3
Water Absorption one side exposure	ASTM D 471 (%)	± 5.0	± 5.0
Dimensional Stability	ASTM D 1204 (%)	0.5	0.5
Low Temperature Flexibility	ASTM D 2136 (F)	-30	-40
Shore "A" Hardness	ASTM D 2240	80	80
Hydrostatic Resistance	ASTM D 751 A (psi)	500	500
Accelerated Weathering 10, 000 hrs	ASTM G155 Xenon Arc Cracking or Crazing	none	none
ASTM G 154 QUV Cracking or Crazing		none	none
Coating Adhesion	ASTM D 751	cannot peel	cannot peel
Fungi Resistance	ASTM G 21, 28 days	no growth	no growth
Oil and Hydrocarbon Resistance	MIL-C 20696C Swelling, Cracking or Leaking	none	none

Approved Manufacturers of comparable Single-Ply Membrane Roofing Systems (either meeting or exceeding the above) are as follows:

Duro-Last Roofing, Inc.
Saginaw, MI 48601
Ph: (800)-248-0280

Seaman Corporation
Sarasota, FL 34243
Ph: (800)-927-8578

Seal-Dry/USA Inc.
Little Rock, AR 72204
Ph: (800)-732-5379

D. Acceptable substrate(s)

1. Authorized insulation, mechanically attached or adhered in approved adhesive.
2. Insulated Structural Concrete.
3. Insulated Steel Decking.
4. Exterior grade plywood; insulated or with approved barrier board or base sheet.
5. Cementitious wood fiber or gypsum, insulated or with approved base.
6. Cellular, lightweight insulating concrete, with approved base sheet.

2.03 RELATED MATERIALS "BY SEAMAN"

The following product(s) / material(s) shall be supplied by Seaman Corporation.

A. FTR Adhesives
Adhesives supplied by Seaman Corporation have been specially formulated for FiberTite Roofing Systems. Application technique and coverage rates will vary according to substrate and environmental conditions. See Table 2 for average coverage rates on common substrates. For information regarding additional/approved substrates and coverage, contact FTCS.

1. FTR-190 Bonding Adhesive
A solvent based, contact type, (two sided) bonding adhesive, designed for bonding FiberTite membrane to clean and dry, pre-approved horizontal or vertical substrates.

2. FTR-290 Adhesive
A solvent based adhesive, one sided application (substrate only), designed for bonding FiberTite-FB membrane to clean and dry, pre-approved horizontal substrates.

3. FTR-390 Adhesive
A rubberized/asphalt water based emulsion adhesive, one side application (substrate only), designed for bonding FiberTite-FB membrane to clean and dry, pre-approved horizontal substrates.

4. FTR-490 Adhesive
A polymeric waterborne, VOC compliant bonding adhesive, one side application

(substrate only), designed for bonding FiberTite-FB (fleece back) membrane to clean and dry, pre-approved horizontal substrates. (See FTR-FB 98 for more information on FiberTite-FB Roofing Systems)

B. FTR #201 Mastic
A trowel grade elastomeric sealant, one side application (substrate only) designed to adhere FiberTite membrane to clean and dry, pre-approved vertical surfaces.

C. FTR #101 Sealant
A one-component gun-grade polyurethanesealant to seal flashing termination.

D. FTR-SL Sealant
A one-component pourable, self-leveling, polyurethane sealant to fill "pitch pans."

E. Fiber Clad Metal
To fabricate metal flashing, 4' x 10' sheets of 24-gauge hot dipped G-90 steel, laminated with a 0.020 mil polymeric coating.

F. FTR-Pre-Molded Flashing(s)
Vent stack and inside/outside corner flashing, thermal-formed from non-reinforced EIP membrane.

G. FTR Non-Reinforced Membrane
Field fabrication membrane, 0.060 mil non-reinforced EIP membrane.

Table 2 – FTR Adhesive rates for common substrates.

Membrane	Adhesive	Substrate	Rate
FiberTite	FTR-190	FiberTite	1.0 gal/100 ft2
FiberTite	FTR-190	Glass facer	1.2 gal/100 ft2
FiberTite	FTR-190	Base sheet	1.0 gal/100 ft2
FiberTite	FTR-190	Masonry	1.2 gal/100 ft2
FiberTite	FTR-190	Wood	1.0 gal/100 ft2
FiberTite	FTR-201	Masonry	4.0 gal/100 ft2
FiberTite	FTR-201	Wood	3.3 gal/100 ft2
FiberTite-FB	FTR-290	Glass facer	1.2 gal/100 ft2
FiberTite-FB	FTR-290	Base sheet	1.0 gal/100 ft2

FiberTite-FB	FTR-290	Cellular lt.wt.	1.2 gal/100 ft2
FiberTite-FB	FTR-390	Glass facer	1.7 gal/100 ft2
FiberTite-FB	FTR-390	Base sheet	1.5 gal/100 ft2
FiberTite-FB	FTR-490	Glass Facer	1.0 gal/100 ft2
FiberTite-FB	FTR-490	Cellular lt.wt	1.0 gal/100 ft2

H. FTR-Tuff Track Walkway & Protection Pads
High grade vinyl walkway / protection material with ribbed "slip resistant" design. See FTR-DM1 for attachment guidelines.

I. FTR P3B Slip Sheet
A 3 oz., UV stable, non-woven polypropylene fabric to be used for membrane divorcement (slip sheet) over reasonably smooth new or existing structural substrates.

J. FTR Recovery Board
A 3/8 inch thick recovery board / underlayment consisting of an extruded polystyrene core with integral plastic facer on both sides. Cut-fold design. See FTR-D14 for attachment guidelines.

K. FTR-Fasteners

1. FiberTite MAGNUM Series
To secure FiberTite to steel, wood and structural concrete decks. A #15-13, buttress threaded, #3 Phillips head fastener constructed of case hardened carbon steel with a reduced diameter drill point and Sentri XP corrosion resistant coating.

2. FiberTite Insulation Fasteners
To secure insulation to steel, wood and structural concrete decks. Heavy duty threaded steel, #3 Phillips truss, self tapping corrosion resistant fastener.

3. FiberTite Spike
To secure insulation and membrane(s) to structural concrete decks. Hard carbon steel, hammer-in, non-threaded fastener.

4. FiberTite NTB-1H
To secure insulation, base sheet and/or membrane to gypsum and cementitious fiber decks. Threaded, glass-filled nylon fastener, with locking wire barbs.

5. FiberTite Peel Rivets

To secure insulation, base sheet and/or membrane to steel, wood, cement fiber, tectum, fiberglass and lightweight plank decks. Threadless, high magnesium aluminum alloy fastener.

6. FiberTite BS Fasteners
   Coated fastener and stress plate to secure base sheet to gypsum and cellular lightweight insulating concrete decks.

L. FTR-MAGNUM Series Barbed Stress Plates
   Used to anchor membrane, are 2.5 in. x 1.5 inch rectangular in dimension with 0.75 in. radia corners, manufactured from 18 gauge AZ-5 galvalume steel with a 0.250 inch diameter hole in its center. The plate has a raised reinforcement area and eight "barbs."

M. FTR-Insulation Stress Plates
   Used to secure insulation to steel, wood and structural concrete decking. Manufactured from high density polyethylene, 3 inch in diameter, designed with a self-locking mechanism to secure the head of the FTR fasteners into the plate.

N. FTR-Termination Bar
   Membrane flashing(s) restraint / termination seals, nominal 1/8" x 1" x 10' 6060-T5 extruded aluminum bar with pre-punched slots, 8" o/c.

O. FiberTite Metal Fascia System
   Two piece "snap-on" pre-formed, aluminum metal edge system.

2.04 RELATED MATERIALS "by others"

A. Wood Nailers

1. Wood shall be No. 2 or better southern yellow pine, kiln dried, wolmanized, conforming to Federal specification TT-550, TT-W-517 and American Wood Preservers Institute Standard LP-2. Creosote or asphaltic type preservatives are not acceptable.
2. Wood nailers shall not exceed a maximum moisture content of 19% by weight on a dry weight basis.

B. Vapor Retarder

1. The decision regarding the inclusion of a vapor retarder within the adhered roof system shall fall within the responsibility of the design professional. Consult N.R.C.A. bulletins for appropriate guidelines.
2. Vapor retarders for use in an adhered roof system shall comply with identifiable code and/or insurance requirements.
3. The vapor retarder manufacturer shall certify, in writing, that the specified vapor retarder meets identifiable code requirements and is approved for its intended use.

C. Insulation

1. Insulation or cover board shall be installed, where specified and/or required, to provide a suitable surface for adhering the FiberTite Roofing System and/or meet desired thermal values.
2. Insulation manufacturer shall certify, in writing, that the insulation meets all identifiable code requirements, is compatible with the proposed FTR-Adhesive(s), and is approved for its intended use.
3. Acceptable products must be pre-approved or approved in writing by Seaman and comply with the following minimal characteristics and classification(s).
    a. FM approved rigid insulation meeting Class 1-90, for fire and wind
    b. UL Classification: Class A
    c. Density: 2.0 pcf. minimum
    d. Meet requirements of Federal Specification HH-I-1972/2
4. Pre-Approved Products
    a. Rmax, Inc.; Multi-Max FA with glass based organic facer
    b. Johns Manville; E'NRG'Y-2 with glass reinforced felt facer
    c. Atlas Roofing Corp.; ACFoam-II with glass fiber reinforced facer
    d. Hunter Panels; H-Shield
    e. Georgia Pacific Corp.; Dens-Deck cover board with glass mat facer
5. If requested, insulation manufacturer shall provide to the building owner a written statement, with a copy to Seaman, that specifically expresses warranty conditions for the successful installation and performance of their insulation.

D. Adhesive(s) for Insulation Attachment

1. General
    a. Adhesive manufacturer shall certify, in writing, that the specified adhesive meets identifiable code requirements, is compatible with the insulation and vapor retarder (if applicable) and is approved for its intended use.
    b. Adhesive shall be listed and approved by Factory Mutual Research in conjunction with the specified insulation and specific substrate.
    c. Adhesive shall exceed FM requirements for 1-90 uplift for individual substrate and insulation combinations.
    d. Adhesive manufacturer shall provide written specifications regarding the safe handling, storage and surface preparation for a quality application of the product.
    e. Adhesive manufacturer shall provide applicable adhesion warranty to Seaman for the performance of their product.
    f. All adhesives shall be pre-approved by Seaman.

2. Hot Asphalt
    a. Asphalt shall be Type III steep asphalt, ASTM D-312.

b. Insulation manufacturer shall certify, in writing, that the specified insulation meets identifiable code requirements when installed with hot asphalt, is compatible with and approved for installation in hot asphalt.
c. All projects utilizing hot asphalt for insulation securement require written authorization, prior to the bidding process, by Seaman Corporation.

3. Polyurethane
    a. Dispensed from a portable pressurized container or traditional foam equipment.
    b. b. Pre-Approved Products
4. Insta-Stik; Flexible Foam Products
5. ER Low Rise Adhesive; ERSystems
6. Urethane-Asphalt
    a. Adhesive shall be single component, non-solvent, elastomeric, urethane adhesive specifically designed for bonding roof insulation to structural roof decks, base sheets, other insulation boards or smooth surfaced BUR.
    b. Pre-Approved Products
7. Weather-Tite; Millennium Adhesives

E. Base Sheets

1. Pre-approved base sheet shall be installed, where specified and/or required, to provide a suitable surface for adhering the insulation and/or FiberTite Roofing System.
2. Acceptable products must be pre-approved or approved in writing by Seaman and comply with the following minimal characteristics and classification(s).
    a. FM approved, Class 1-90, wind uplift.
    b. ASTM D 4601 Type II Asphalt Coated Glass-Fiber Base Sheet
    c. ASTM D 4897 Type II Asphalt Coated Glass-Fiber Venting Base Sheet
    d. Foil/Kraft Laminate w/min tensile of 54 lb/1" according to ASTM D 828

3. Pre-Approved Products
    a. GAF; GAFGLAS #80 Premium
    b. GAF; GAFGLAS Stratavent
    c. Celotex; Hydro-Stop

PART 3 – EXECUTION

3.01 GENERAL

A. The authorized roofing contractor shall be responsible for providing a suitable substrate for the proper installation of the FiberTite membrane and specified components.

B. Application of Seaman / FiberTite materials constitutes an agreement that the authorized roofing contractor has inspected and found the substrate suitable for the installation of the FiberTite Roofing System.

C. The authorized roofing contractor shall be responsible for coordinating the installation to insure that the system remains watertight during and at the end of each working day.

3.02 SUBSTRATE PREPARATION (General)

A. The roofing contractor shall be responsible for verifying that the deck condition and/or existing roof construction is suitable for the specified installation of the FiberTite Adhered Roofing System.
B. Seaman requires fastener withdrawal values (pull out tests) to verify the deck condition for adhered roof systems utilizing mechanically attached insulation and/or base sheets.
C. Examine surfaces for inadequate anchorage, low areas that will not drain properly, foreign material, ice, wet insulation, unevenness or any other defect which would prevent the proper execution and quality application of the FiberTite Roofing System as specified.
D. Prepared substrate shall be smooth, dry, free of debris and/or any other irregularities which would interfere with the installation of the adhered FiberTite Roofing System.
E. Do not proceed with any part of the application until all defects and preparation work have been corrected and complete.

3.03 SUBSTRATE PREPARATION (New Construction)

A. Steel Deck

1. Steel decking should conform to Factory Mutual (FM) guidelines for Class-1 insulated steel deck construction.
2. Steel decking should be constructed of a minimum 22 gauge cold rolled steel sheets with factory G-90 galvanized coating.
3. Panel profiles (ribs) shall be formed to minimize deflection and provide suitable strength and integrity to support anticipated structural live and dead loads.
4. Steel decking shall be installed in compliance with specified design criteria and local building code requirements.
5. Fastener withdrawal tests shall be performed on all "Non-FM Approved" steel decking, (decking less than 22 gauge) to determine suitability for and appropriate fastener patterns and densities for mechanical attachment of insulation and/or base sheet.

B. Structural Concrete (Poured and/or Pre-cast)

1. Decking shall be installed in strict conformance with industry standards, practices and/or pre-cast panel manufacturer's installation requirements.
2. Decking shall be installed to provide positive slope and subsequent positive drainage of the new adhered FiberTite Roofing System.
3. Finished decking shall be properly cured and dry, prior to the installation of approved insulation.

4. Finished surface(s) to receive new roof system shall be smooth and level without significant surface depressions or irregularities. Camber differentials greater than 3/16 inch must be leveled using a cementitious grout.
5. Finished surfaces shall be free of moisture, dust, loose debris and any other irregularity that may hinder the proper performance of the new FiberTite Roofing System.

C. Wood

1. Wood decking should conform to Factory Mutual (FM) guidelines for Class-1 impregnated wood decking.
2. Wood decking should be constructed of a minimum 2 inch thick wood plank or minimum 3/4 inch plywood.
3. Wood decking shall be sound, well seasoned or kiln dried and of proper thickness to accommodate design loads (including wind up-lift) according to specified design criteria and/or local building code requirements.
4. Wood decking shall be installed to provide positive slope and subsequent positive drainage of the new adhered FiberTite Roofing System.
5. Fastener withdrawal tests shall be performed on all "Non-FM Approved" wood decking (wood plank less than 2 inches thick or plywood less than 3/4 inch thick) to determine suitability for and appropriate fastener patterns and densities for mechanical attachment of insulation, cover board and/or base sheet.

D. Cementitious Fiber

1. Molded panels shall be installed in strict accordance with the manufacturer's installation requirements.
2. Decking shall be installed to provide positive slope and subsequent positive drainage of the new adhered FiberTite Roofing System.
3. Vertical alignment between adjacent panels shall provide a uniform substrate. Alignment differences shall be no greater than 1/8 inch and shall be leveled with cementitious grout.
4. Fastener withdrawal tests shall be performed on all cement fiber decking to determine suitability for and appropriate fastener patterns and densities for mechanical attachment of insulation and/or cover board.

E. Poured Gypsum Concrete

1. Gypsum decks shall be installed in strict accordance with standard industry practice, the manufacturer's installation requirements and local building code requirements.
2. Decking shall be installed to provide positive slope and subsequent positive drainage of the new adhered FiberTite Roofing System.
3. The gypsum fill shall be reinforced with wire mesh at a proper depth within the fill.
4. Finished decking shall maintain a minimum thickness (not including the form board) of 2 inches.

5. Fastener withdrawal tests shall be performed on all gypsum decking to determine suitability for and appropriate fastener patterns and densities for mechanical attachment of insulation, cover board and/or base sheet.
6. Finished surfaces shall be free of exposed reinforcing mesh, moisture, dust, loose debris and any other irregularity that may hinder the proper performance of the new FiberTite Roof System.

F. Lightweight "Cellular" Insulating Concrete

1. Lightweight "Cellular" insulating concrete, herein after referred to as "lightweight
2. concrete," shall be installed by trained applicators, approved in writing by the Lightweight Manufacturer.
3. Lightweight concrete shall be installed in strict accordance the manufacturer's installation requirements and standard industry practices.
4. The finished lightweight concrete installation shall exhibit an oven dry density of a nominal 30 pounds per cubic foot and a minimum compressive strength greater than 200 psi.
5. The lightweight concrete shall be installed to provide positive slope and subsequent positive drainage of the new adhered FiberTite Roofing System.
6. Finished lightweight concrete shall be a minimum thickness of 2 inches, properly cured and dry, prior to the installation of the FiberTite Roof System.
7. Finished surface(s) shall be treated per manufacturer's recommendations to insure uniform curing and surface hardness.
8. Finished surface(s) shall be free of depressions, moisture, dust, loose debris and any other irregularity that may hinder the proper installation and performance of the new FiberTite Roofing System.
9. For FiberTite Roofing System installed over mechanically fastened base sheet(s), the cured deck integrity must yield fastener withdrawal resistance values greater than 90 lb.

3.04 SUBSTRATE PREPARATION (Re-Roofing)

A. General

1. Roofing Contractor shall be responsible for informing the building owner/owner representative with regard to the condition and structural integrity of the existing decking.
2. The building owner/owner representative shall make and be responsible for the determination as to the proper method of treatment and/or replacement.
3. Re-roofing applications require fastener withdrawal tests to substantiate proposed attachment patterns for insulation and/or base sheets.
4. Re-roofing applications require modifications to the deck and/or insulation system to provide positive slope and subsequent positive drainage of the new FiberTite Roofing System.

B. Removal of Existing Roof System(s)

1. Remove all existing roofing material(s), insulation, flashing, metal and deteriorated wood blocking and legally dispose of off-site.
2. Remove only enough roofing to accommodate the days' work and ensure the exposed area can be made 100% watertight at the end of the day or first sign of inclement weather.

C. Re-cover of Existing Roof System(s)

1. Remove all loose aggregate and debris by power broom and/or vacuum and legally dispose of off-site.
2. Remove and replace all wet or deteriorated insulation and wood blocking.
3. Clean all exposed metal surfaces such as pipes, pipe sleeves, drains, duct work, etc., by removing loose paint, rust and any asphalt or coal tar pitch of any kind. Remove and discard lead sleeves at soil stacks.
4. If the existing roof is coal tar pitch or has been repaired with coal tar pitch or has been re-saturated with coal tar pitch, a minimum 10 mil polyethylene "pitch vapor" retarder will be required.

D. Steel and Wood Decks

1. All rotted and/or deteriorated decking shall be removed and replaced with like kind.
2. Areas of structurally acceptable steel decking exhibiting slight surface rust shall be properly cleaned, primed and painted prior to installing the approved insulation.
3. All decking shall be inspected for proper attachment and excessive deflection that would compromise the uplift performance of the new FiberTite Roofing System.
4. Attachment and deflection deficiencies shall be repaired and brought into compliance with current, local building code requirements.

E. Concrete, Gypsum and Cementitious Fiber

1. Deteriorated decking shall be repaired and/or replaced with appropriate materials according to standard industry regulations and practices.
2. Repair any depressions and/or areas where reinforcing has become exposed.
3. When new insulation system is to be installed using hot asphalt or an approved adhesive:
    a. Cracks and/or camber differentials greater than 3/16 inch shall be repaired using an appropriate cementitious grout or fill, and feathered to promote a smooth transition.
    b. Joints between pre-stressed, panel units and over bulb-tees shall be either taped, stripped or grouted with an appropriate cementitious fill.
    c. All surface irregularities shall be leveled to insure a minimum of 85% contact with the decking for insulation bonded in hot asphalt or approved adhesives.

4. Where insulation is to be mechanically attached, camber differentials and/or surface irregularities of up to 1/2 inch shall be acceptable.

F. Lightweight "Insulating" Concrete

1. All saturated lightweight shall be removed and replaced with appropriate and/or compatible material.
2. Surface to receive new roof system shall be smooth and free of ridges, depressions and other irregularities.
3. Repair any depressions, irregularities and/or excessive deflection with compatible material.

3.05 WOOD NAILERS

A. Install treated lumber at the same heights as insulation layer or adjacent construction ± 1/4 in. Continuous treated wood nailers are to be installed at all perimeters, roof projections and penetrations as shown in approved details. In re-cover applications, the surface under the wood nailers shall be FREE OF ALL GRAVEL and shall be as even as possible.
B. Where wood nailers are installed directly on the substrate, the substrate shall be carefully examined to confirm that the entire area provides a suitable fastening surface. All defects shall be repaired by the appropriate trade prior to installation.
C. Nailers shall be installed and anchored in such a manner to resist a force of 250 lbf. per linear foot of wood blocking in any direction.
D. Nailers along parapets, curbs and expansion joints are recommended for insulated decking. Consult FiberTite Construction Details or Technical Customer Services for optional/alternate membrane termination/securement methods.

3.06 BASE SHEET

A. General

1. Approved base sheet shall be applied only to properly prepared and pre-approved substrates.
2. Install no more than can be covered or made 100% water-tight during the same working day.
3. Field pull-out tests must be performed for mechanically attached base sheets to determine fastener withdrawal performance.
4. Base sheets shall be installed starting at the low point of the roof deck.
5. Base sheet shall be side lapped, properly shingled to shed water, a minimum of 3 inches, leaving an exposure of approximately 33 inches.

B. Mechanically Attached Base Sheet

1. All base ply fasteners and stress plates for the mechanical attachment of base sheets shall be FTR BS Fasteners as provided by Seaman.
2. For attachment, approved base sheet is secured to the deck in the field of the roof, with FiberTite BS Fasteners, spaced a maximum of 7 inches o.c. through the

minimum 3 inch side laps and at a maximum 7 in. o.c. in two rows within the field of the sheet.
3. The number of fasteners securing the base sheet shall be increased over the field spacing by 70% in the perimeter and 160% in the corners of the roof area.
4. Fastening increases can be obtained by adding rows of fasteners and/or additional fasteners along each row.

C. Base Sheet Adhered with Hot Asphalt

1. Hot asphalt shall be applied only to properly prepared and pre-approved substrates, free of any debris, dirt, grease, oil or moisture.
2. Base sheet shall be embedded into fluid, continuous application of hot Type III steep asphalt at a minimum application rate of 25 lbs per 100 ft2.
3. Base sheet shall be fully bonded to the substrate.

3.07 ROOF INSULATION

A. General

1. Install no more than can be covered during the same working day.
2. Roof insulation shall be installed where by the long dimension of the insulation panel(s) run in parallel alignment and the short dimension of the insulation panel(s) are staggered.
3. Insulation panels shall be installed with minimum joint dimensions and shall be tightly butted, where possible. Maximum joint widths shall be 3/8 in. Damaged corners shall be cut out and replaced with an insulation piece a minimum of 12 in. x 12 in. Insulation pieces which are cut from larger panels and are smaller than one square foot shall not be acceptable.
4. Taper roof insulation to drain sumps using tapered edge strips. If insulation layer is
5. 1-1/2 in. or less, taper 12 in. from the drain bowl. If insulation thickness exceeds 1-1/2 in., taper 18 in. from the drain bowl. Mechanically fasten all tapers using two fasteners per board.
6. At the end of each working day, provide a watertight cover on all unused insulation to avoid moisture penetration.

B. Mechanically Attached Insulation

1. Insulation shall be applied only to properly prepared and pre-approved substrates, free of any debris, dirt, grease, oil or moisture.
2. All fasteners and stress plates for the mechanical attachment of insulation and / or cover board materials shall be FTR Fasteners as provided by Seaman.
3. All fasteners and stress plates shall be Factory Mutual Research approved for mechanical attachment of insulation and comply with FM Standard 4470 for corrosion resistance.
4. 1-90 attachment for insulation, 2 inch thickness = 1 fastener and stress plate per 4 ft2 of insulation.

5. 1-90 attachment for insulation, < 2-inch thickness = 1 fastener and stress plate per 2 ft2 of insulation.
6. Roof insulation shall be fastened in accordance with the roof insulation manufacturer's recommendations and must be approved by the FTCS.
7. Fasteners shall be installed in accordance with manufacturer's recommendations, complying with minimum penetration requirements for specific deck types.
8. Fasteners shall be installed using depth sensing tool attachments to insure proper installation.

C. Adhered Insulation

1. Hot Asphalt
    a. Hot asphalt shall be applied only to properly prepared and pre-approved substrates, free of any debris, dirt, grease, oil or moisture.
    b. Insulation shall be set into a continuous flood coat of hot Type III steep asphalt applied to compatible substrate or properly attached base sheet/vapor retarder at a minimum application rate of 25 lbs per 100 ft2.
    c. Insulation shall be fully bonded to the substrate with a maximum board size of 4 ft. x 4 ft.
    d. Insulation shall be laid in such a manner to avoid squeezing hot asphalt between insulation joints. Exposed asphalt will require appropriate separation layer(s) prior to installing the new adhered FiberTite Roofing System.
    e. Adhered insulation applications may require mechanical enhancement of exterior perimeter areas as outlined in FM LPD 1-29.

2. Polyurethane or Urethane Asphalt
    a. Adhesive shall be applied only to properly prepared and pre-approved substrates, free of any debris, dirt, grease, oil or moisture.
    b. The minimum product temperature at time of application shall be 70¡F.
    c. The minimum ambient and surface temperature shall be 40¡F.
    d. Insulation shall be set into a continuous 3/4" bead of adhesive at a minimum rate of one linear foot of adhesive for every one square foot of insulation board.
    e. Adhesive rates are to be increased in roof perimeter and corner zones per manufacturer's design recommendations.
    f. Place in the insulation boards onto the adhesive beads and walk on the boards, spreading the adhesive for maximum contact.
    g. A second walking will be required after ten (10) minutes to insure maximum contact and bond strength.
    h. Insulation shall be fully bonded to the substrate with a maximum board size of 4 ft. x 4 ft.

3.08 INSTALLATION OF FIBERTITE MEMBRANE

A. Quality Control

1. It is the responsibility of the roofing contractor to initiate a Quality Control program to govern all aspects of the installation of the new adhered FiberTite Roofing System.
2. The job foreman and or supervisor will be responsible for the daily execution of the QC program which will include but is not limited to the supervision and inspection during substrate preparation, installation of insulation and/or base sheet, the application of adhesive(s), fasteners and probing of all heat welding incorporated within the FiberTite system.
3. If any inconsistencies, in the overall quality of the installation, including but not limited to the adhesion of the FiberTite membrane or in the quality of the welds are found, all work shall cease until corrective actions are taken to insure the continuity of all workmanship.

B. General

1. All work shall be coordinated to insure that the sequencing of the installation will allow for a 100% watertight installation at the end of each work day.
2. Adhered FiberTite Roofing System may utilize either conventional "roll goods" 56" x 100' or pre-fabricated "non-tabbed" rolls up to 20' wide and 100' in length.
3. Outside ambient air temperature must be above 40¡F to insure proper bonding.
4. Drying time of the attachment adhesive will be affected by ambient temperatures and must be taken into consideration when determining roll sizes and installation sequencing.

C. Membrane Attachment

1. Over the properly installed/prepared substrate surface, position the FiberTite Membrane and fold the sheet to allow a workable exposure of the underside of the sheet.
2. Apply a 100% continuous coat of bonding adhesive to the exposed bottom side of the membrane and a mirrored area of the substrate.
    a. The amount of membrane and substrate that can be coated with adhesive will be determined by application method, ambient temperature, humidity and available manpower.
    b. Adhesive may be applied by roller or spraying.
    c. Roller applied adhesive shall utilize a solvent resistant 3/4" nap roller, spreading the adhesive to insure a smooth, even, 100% coverage of the substrate and membrane.
    d. Spray applied adhesive must be spread out by roller to insure a smooth, even, 100% coverage of the substrate and membrane with no holidays, globs, puddles or similar irregularities.
    e. Adhesive coverage should average 100 sq. ft. per gallon (± 10%) of applied adhesive with a 50 sq. ft. per gallon net coverage for the membrane and substrate combined.
3. Allow the adhesive to dry to a point of being tacky, but not stringy to the touch. Do not allow adhesive to "dry out" completely.

4. When sufficiently dry, carefully maneuver the glued portion of the membrane onto the glued substrate surface, avoiding any wrinkles or air pockets.
5. Broom the adhered portion of the membrane to insure full contact and complete the bonding process by firmly pressing the bonded membrane into place with a weighted, foam-covered, lawn roller.
6. Repeat the process for the remaining un-bonded portion of the membrane, lapping subsequent, adjacent rolls of membrane a minimum of 3 inches, insuring proper shingling of the membrane to shed water along the laps.
7. No adhesive shall be applied to the lap "seam" areas of the membrane. Contaminated areas will inhibit proper welding of the seams.

D. Hot Air Welding

1. General
    a. All field seams exceeding 10 ft. in length shall be welded with an approved automatic welder.
    b. All field seams must be clean and dry prior to initiating any field welding.
    c. Remove foreign materials from the seams (dirt, oils, etc.) with Acetone, MEK, or approved alternative. Use clean cotton cloths and allow approximately five minutes for solvents to dissipate before initiating the automatic welder. Do not use denim or synthetic rags for cleaning.
    d. All welding shall be performed only by qualified personnel to ensure the quality and continuity of the weld.
2. Hand Welding
    a. The lap or seam area of the membrane should be intermittently tack welded to hold the membrane in place.
    b. The back "interior" edge of the membrane shall be welded first, with a thin, continuos weld to concentrate heat along the exterior edge of the lap during the final welding pass.
    c. The nozzle of the hand-held hot air welder shall be inserted into the lap at a 45¡ angle to the lap. Once the polymer on the material begins to flow, a hand roller shall be use to apply pressure at a right angle to the tip of the hand welder. Properly welded seams shall utilize a 1-1/2'" wide nozzle, to create a homogeneous weld, a minimum of 1-1/2" in width.
    d. Smaller nozzles may be used for corners, and other field detailing, maintaining a minimum 1" weld.
3. Automatic Machine Welding
    a. Proper welding of the FiberTite Membrane can be achieved with a variety of automatic welding equipment. Contact FTCS for specific recommendations.
    b. Follow all manufacturer's instructions for the safe operation of the automatic welder.
    c. Follow local code requirements for electric supply, grounding and surge protection.
    d. The use of a dedicated, portable generator is highly recommended to insure a consistent electrical supply, without fluctuations that can interfere with weld consistency.

e. Properly welded seams shall utilize a 1-1/2'" wide nozzle, to create a homogeneous weld, a minimum of 1-1/2" in width.

E. Inspection

1. The job foreman and/or supervisor shall initiate daily inspections of all completed work which shall include, but is not limited to the probing of all field welding with a dull pointed instrument.
2. Insure that all aspects of the installation (sheet layout, attachment, welding, flashing details, etc.) are in strict conformance with the most current FiberTite Roofing System Specifications and Details.
3. Excessive patching of field seams will not be accepted at time of FINAL INSPECTION FOR WARRANTY ACCEPTANCE.

3.09 FLASHING

A. Clean all vents, pipes, conduits, tubes and stacks to bare metal. All protrusions must be properly secured to the roof deck with approved fasteners. Remove and discard all lead, pipe and drain flashing. Flash all penetrations according to approved details.
B. Remove all loose and/or deteriorated cant strips and flashing.
C. Flash all curbs, parapets and interior walls in strict accordance with approved FiberTite details.
D. All flashing shall be fully adhered to properly prepared, approved substrate(s), with either FTR- 190 adhesive or FTR #201 mastic applied in sufficient quantity to insure total adhesion.
E. The base flange of all membrane flashing shall extend out on to the plane of the deck, beyond the wood nailer to a maximum width of 8 in.
F. Vertical flashing shall be terminated no less than 8 in. above the plane of the deck with approved termination bar and counter-flashing or metal cap flashing.
G. Vertical wall flashing termination shall not exceed 30 in. without supplemental mechanical attachment of the flashing between the deck and the termination point of the flashing when using FTR #201 as the flashing adhesive.
H. Complete all inside and outside corner flashing details with FiberTite pre-formed corners or an approved field fabrication detail.
I. Probe all seams with a dull pointed probe to insure the weld has created a homogeneous bond.
J. Install penetration accessories in strict accordance with approved details. Insure penetration accessories have not impeded in any way the working specification. (Refer to the related trade for the technical specification).

3.10 METAL FLASHING

A. Perimeter edge details are to be fabricated from Fiber-Clad Metal or FiberTite Metal Fascia System.
B. Insure all fascia extend a minimum of 2 in. below the bottom of the wood nailers.

C. Fasten all metal flashing to wood nailers or approved substrate with approved fasteners 8 inches on center.
D. Break and install Fiber Clad metal in accordance with approved details. Insure proper attachment with 1/2 in. expansion joints and the installation of a minimum 2" bond breaker tape prior to sealing the joint.
E. Weld a 5" strip of FiberTite membrane over the Fiber Clad metal expansion joints. (Cover plates are optional.)
F. Roof Drains
    1. Flash all roof drains in accordance with FiberTite details.
    2. Replace all worn or broken parts that may cut the FiberTite membrane or prevent a watertight seal. This includes the clamping ring and strainer basket.
    3. Replace all drain bolts or clamps used to hold the drain compression ring to the drain bowl.
    4. FiberTite non-reinforced 60 mil membrane shall be used for flashing the drain assembly.
    5. Drain assemblies and basins or "sumps" must be free of any asphalt or coal tar pitch residue prior to installation.
G. Pitch Pans
    1. Reasonable effort shall be made to eliminate the need for pitch pans including the removal of all existing pans. Contact FiberTite Technical Customer Services for specific design alternatives and recommendations.
    2. In the event of no alternative, fabricate pitch pans from Fiber Clad metal, installed in accordance with FiberTite details, insuring proper attachment, maintaining a minimum of 2 in. clearance around the penetration.
    3. Pitch pans shall be filled with non-shrinking grout to within 2" of the top of the pan. Allow the grout to dry and install a wax paper bond breaker over the grout.
    4. Fill the remainder of pan with FTR-SL1 pourable sealant.
    5. Pitch Pans and the sealant will require periodic maintenance by the building owner's maintenance personnel to prevent their specific exclusion from the warranty.

3.11 EXPANSION JOINTS

A. Flash all expansion joints in accordance with authorized details. Fasten all expansion joint material according to FiberTite specifications.
B. If the expansion joint is a "pre-formed" system, the manufacturer, description and a drawing illustrating the method of installation must be included when the FTR-WRF is submitted.

3.12 SEALANTS

A. Apply authorized sealant(s) to all surface mounted reglets and where specified. Sealant(s) are to shed water, following manufacturer's instructions and installation guides.
B. Use primer when recommended by the manufacturer.
C. Sealants will require periodic maintenance by the building owner's maintenance personnel to prevent their specific exclusion from the warranty.

3.13 TEMPORARY SEALS

A. At the end of each working day or at the first sign of inclement weather, install temporary, 100% watertight seal(s) where the completed new roofing adjoins the uncovered deck or existing roof surface.
B. The authorized roofing contractor shall create and maintain the temporary seal in such a manner as to prevent water from traveling beneath the new and/or existing roof system.
C. The use of plastic roofing cement is permissible when sealing to an existing built up roof.
D. If water is allowed to enter beneath the newly completed roofing, the affected area(s) shall be removed and replaced at no additional expense to the building owner.
E. Prior to the commencement of work, cut out and remove all contaminated membrane, insulation, roof cement and/or sealant and properly dispose of off-site.

3.14 WALKWAYS

A. FiberTite walkways and protection pads shall be installed at staging areas for roof-top equipment maintenance or areas subject to regular foot traffic.
B. Walkway Installation
   1. Roofing membrane to receive walkway material shall be clean and dry.
   2. Cut and position the FiberTite walkway material (5/32" x 30" x 40' roll) as directed by the specifications or agreement.
   3. Hot air weld the entire perimeter of the walkway to the previously cleaned FiberTite roofing membrane.
   4. Care must be taken during the welding process to insure that the underlying membrane is not scorched.
C. Protection Pad Installation
   1. Roofing membrane to receive protection pad material shall be clean and dry.
   2. Prior to installing the FiberTite protection pads (1/4" x 2' x 4'), weld a 6" x 6" strip of FiberTite membrane to each of the four corners on the back side of the pad.
   3. Position the strips in such a way that they overhang the 90¡ corners of the pad a minimum of two inches.
   4. Position the FiberTite protection pads as directed by the specifications or agreement and weld the visible portion of the previously applied stripping to the FiberTite roofing membrane.

3.15 LIGHTNING PROTECTION

A. The installation of lightning protection must be coordinated with the authorized FiberTite roofing contractor, certified lightning contractor and the building owner.
B. The lightning protection must be installed in such a manner that base plates, air terminals and cables do not penetrate the roofing membrane without the use of pre-approved flashing details.
C. Cables and air terminals may be attached to the membrane using base plates and an approved construction adhesive or by welding intermittent strips of FiberTite membrane

over the base plates and cables to the FiberTite roofing. Contact FiberTite Technical Customer Services for specific adhesive recommendations.

D. Recommendations regarding the selection of adhesives or alternative affixing of lightning protection systems to the FiberTite membrane does not in any way imply a warranty covering their performance or ability of the adhesives to remain affixed to the FiberTite membrane.

3.16 COMPLETION

A. Remove any and all debris, excess materials and scrap of any kind from the roof and surrounding premises prior to demobilization.
B. Inspect all field welds, detailing and terminations to insure a 100% the watertight installation.

3.17 WARRANTY INSPECTION

A. Upon completion of the project, the authorized roofing contractor shall complete and submit the FiberTite Project Completion Notice to FiberTite Technical Customer Services.
B. Upon receipt of the notice of completion, a FiberTite Technical Customer Service Representative will schedule an inspection with a representative of the authorized roofing contractor to thoroughly review the installation and verify compliance with Seaman Corporation specifications.
C. Any corrections or modifications necessary for compliance with the specifications and acceptance for warranty (punch list) will be noted on the Final Inspection for Warranty Form.
D. Upon completion of all punch list items and final acceptance of the installation, a warranty will be issued in accordance with the Seaman Corporation, pre-approved project specifications and Warranty Request Form.

*****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 07605 - STANDING SEAM METAL ROOF AND FASCIA PANELS

PART 1 - GENERAL

1.01 The roofing assembly includes preformed sheet metal panels, related accessories, valleys, hips, ridges, eaves, corners, rakes and miscellaneous flashing and attaching devices. All roofing assemblies and accessories shall be manufactured by one of the following:

A. Berridge Manufacturing Company, Inc.
Phone: 1-800-231-8127

B. AEICOR Metal Products, Inc.
Phone: 1-800-432-1802

C. AEP SPAN
Phone: 1-800-527-2503

D. AMP, Atlanta Metal Products, Inc.
Phone: 1-800-554-1097

E. BUTLER Manufacturing Company
Phone: 1-816-968-2380

F. DELCOA Metal Roofing Manufacturer
Phone: 1-800-375-METAL

G. UNA-CLAD, Copper Sales, Inc.

H. McELROY METALS, INC.
Phone 1-800-950-6533

I. PAC-CLAD / Petersen Aluminum
Phone 1-800-272-4482

J. ENGLERT, INC.
Phone 732-826-8614

1.02 STORAGE AND HANDLING

Store panels and materials properly and adequately to protect from damage and entrapped water.

1.03 WARRANTY

Submit a written three (3) year warranty from installer and manufacturer against leaks, defective workmanship and materials. Submit manufacturer's written finish warranty that

applies. Shall meet Underwriter's Laboratory UL90 classification. Provide manufacturer's standard twenty (20) year warranty against color change or chalking.

1.04 REFERENCES

A. S.M.A.C.N.A. (Sheet Metal and Air Conditioning Contractor's National Association).
B. N.R.C.A. (The National Roofing Contractors Association). Roofing and Waterproofing Manual, including construction details, and Handbook of Accepted Roofing Knowledge.
C. Manufacturer's Construction Details Handbook.
D. ASTM A-653-97
E. ASTM A-525-86
F. ASTM A-792-86
G. ASTM B-209
H. ASTM B-370
I. Aluminum Association.

1.05 SUBMITTALS

A. Installing contractor shall submit detailed shop drawings showing layout of panels, anchoring details, joint details, trim, flashing and accessories. Show details of weatherproofing, terminations, and penetrations of metal work.

B. Installing contractor shall submit a sample of each type of roof panel, complete with factory finish.

C. Installing contractor shall submit calculations with registered engineer seal, verifying roof panel and attachment method resists wind pressure imposed on it pursuant to applicable building codes.

PART 2 - PRODUCTS

2.01 METAL ROOF, AND/OR, FASCIA PANELS

As manufactured by one of the approved Manufacturing Corporations.
NOTE: Match existing panel color and profiles when connecting to existing buildings.

2.02 SHEET MATERIALS

A. Panel configuration to be a structural standing seam. Panel widths and seam heights will vary with project type. Refer to the Construction Drawings for required panel widths and seam types. Panel color as specified by the Architect on the construction documents. Single lengths, installed in strict accordance with manufacturer=s specifications.

B. Panels shall be one of the following types as called out on the Construction Documents.

1. Steel shall be ASTM A653-97 Grade C, G90, Coating ASTM 525-86 Hot Dipped Galvanized, 24-gauge galvalume ASTM A-792-86. Maximum panel length is 65'.

2. Aluminum shall be ASTM B-209 in .032 inch or .040-inch thickness with an H-14 temper.

3. Copper shall be ASTM B-370 colled rolled in 16 or 20 ounce.

2.03 FASTENING

Fastening is to be installed at spacings per manufacturer=s specifications at perimeters and field. Fasteners shall be stainless and shall be a minimum of #8 wafer head type screws compatible with the material being used, concealed at all times. If and exposed fastener must be used, it can only be a #44 pop rivet of the same material (or compatible) and finish as the roof panels.

2.04 FLASHINGS

Flashings are to be of the same gauge, material and finish.

2.05 ACCESSORIES

All accessories must be of compatible materials to the metal panels.

2.06 FINISH

Finish shall be Kynar 500 or Hylar 5000 Fluorocarbon coating applied on the Manufacturer's Coil Coating Line with a top side film thickness of 0.70 to 0.90 mil over 0.25 to 0.31 mil prime coat to provide a total dry film thickness of 0.95 to 1.25 mil. Bottom side shall be coated with a primer with a dry film thickness of 0.25 mil. Finish shall conform to all tests for adhesion, flexibility and longevity as specified by Kynar 500 or Hylar 5000 finish supplier.

PART 3 - INSTALLATION

3.01 Install metal roof/fascia systems per the manufacturer=s specifications.

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

3.03 Upon completion of the metal roof/fascia system installation, an inspection will be made

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

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

SECTION 07605 - STANDING SEAM METAL ROOF AND FASCIA PANELS

PART 1 - GENERAL

1.01 The roofing assembly includes preformed sheet metal panels, related accessories, valleys, hips, ridges, eaves, corners, rakes and miscellaneous flashing and attaching devices. All roofing assemblies and accessories shall be manufactured by one of the following:

A. Berridge Manufacturing Company, Inc.
Phone: 1-800-231-8127

B. AEICOR Metal Products, Inc.
Phone: 1-800-432-1802

C. AEP SPAN
Phone: 1-800-527-2503

D. AMP, Atlanta Metal Products, Inc.
Phone: 1-800-554-1097

E. BUTLER Manufacturing Company
Phone: 1-816-968-2380

F. DELCOA Metal Roofing Manufacturer
Phone: 1-800-375-METAL

G. UNA-CLAD, Copper Sales, Inc.

H. McELROY METALS, INC.
Phone 1-800-950-6533

I. PAC-CLAD / Petersen Aluminum
Phone 1-800-272-4482

J. ENGLERT, INC.
Phone 732-826-8614

1.02 STORAGE AND HANDLING

Store panels and materials properly and adequately to protect from damage and entrapped water.

1.03 WARRANTY

Submit a written three (3) year warranty from installer and manufacturer against leaks, defective workmanship and materials. Submit manufacturer's written finish warranty that

applies. Shall meet Underwriter's Laboratory UL90 classification. Provide manufacturer's standard twenty (20) year warranty against color change or chalking.

1.04 REFERENCES

A. S.M.A.C.N.A. (Sheet Metal and Air Conditioning Contractor's National Association).
B. N.R.C.A. (The National Roofing Contractors Association). Roofing and Waterproofing Manual, including construction details, and Handbook of Accepted Roofing Knowledge.
C. Manufacturer's Construction Details Handbook.
D. ASTM A-653-97
E. ASTM A-525-86
F. ASTM A-792-86
G. ASTM B-209
H. ASTM B-370
I. Aluminum Association.

1.05 SUBMITTALS

A. Installing contractor shall submit detailed shop drawings showing layout of panels, anchoring details, joint details, trim, flashing and accessories. Show details of weatherproofing, terminations, and penetrations of metal work.

B. Installing contractor shall submit a sample of each type of roof panel, complete with factory finish.

C. Installing contractor shall submit calculations with registered engineer seal, verifying roof panel and attachment method resists wind pressure imposed on it pursuant to applicable building codes.

PART 2 - PRODUCTS

2.01 METAL ROOF, AND/OR, FASCIA PANELS

As manufactured by one of the approved Manufacturing Corporations.
NOTE: Match existing panel color and profiles when connecting to existing buildings.

2.02 SHEET MATERIALS

A. Panel configuration to be a structural standing seam. Panel widths and seam heights will vary with project type. Refer to the Construction Drawings for required panel widths and seam types. Panel color as specified by the Architect on the construction documents. Single lengths, installed in strict accordance with manufacturer=s specifications.

B. Panels shall be one of the following types as called out on the Construction Documents.

1. Steel shall be ASTM A653-97 Grade C, G90, Coating ASTM 525-86 Hot Dipped Galvanized, 24-gauge galvalume ASTM A-792-86. Maximum panel length is 65'.

2. Aluminum shall be ASTM B-209 in .032 inch or .040-inch thickness with an H-14 temper.

3. Copper shall be ASTM B-370 colled rolled in 16 or 20 ounce.

2.03 FASTENING

Fastening is to be installed at spacings per manufacturer=s specifications at perimeters and field. Fasteners shall be stainless and shall be a minimum of #8 wafer head type screws compatible with the material being used, concealed at all times. If and exposed fastener must be used, it can only be a #44 pop rivet of the same material (or compatible) and finish as the roof panels.

2.04 FLASHINGS

Flashings are to be of the same gauge, material and finish.

2.05 ACCESSORIES

All accessories must be of compatible materials to the metal panels.

2.06 FINISH

Finish shall be Kynar 500 or Hylar 5000 Fluorocarbon coating applied on the Manufacturer's Coil Coating Line with a top side film thickness of 0.70 to 0.90 mil over 0.25 to 0.31 mil prime coat to provide a total dry film thickness of 0.95 to 1.25 mil. Bottom side shall be coated with a primer with a dry film thickness of 0.25 mil. Finish shall conform to all tests for adhesion, flexibility and longevity as specified by Kynar 500 or Hylar 5000 finish supplier.

PART 3 - INSTALLATION

3.01 Install metal roof/fascia systems per the manufacturer=s specifications.

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

3.03 Upon completion of the metal roof/fascia system installation, an inspection will be made

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

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

SECTION 07710 - HEAVY DUTY ALUMINUM GUTTERS AND DOWNSPOUTS

1.01 GENERAL

A. The gutter and downspout system shall be an Industrial Series as manufactured by Southern Aluminum Finishing Company or an approved equal.

B. Furnish and install a perimeter gutter and downspout system as located on the drawings. The size shall be as per the details on the drawings. The gutter and downspouts shall be manufactured of aluminum, .040 (18 gauge) thickness. Note that some projects will require .060 structural gutters and downspouts. Refer to plans for types, gauges and sizes.

1. **Colors:** Metal Buildings: Gutters and Downspouts Match Wall Panel Color Using E.S.P. or an anodized finish.
2. Other Buildings: Gutters and Downspouts as called out on the plans. Utilize ESP white or Medium Bronze anodized. When downspouts are called out as painted, match the field wall color using Acrylic Latex paint.

C. Gutters shall be tapered and notched to provide a 1" telescoping lap joint. Gutters shall be pre-punched at 12" on center to provide for thermal movement.

D. Provide manufacturer's support brackets and interior straps. Brackets shall be a compatible material to gutter with matching finish and color.

2.01 INSTALLATION

A. Support Bracket Installation:
Install support brackets at 30" on center to allow a maximum 1/8" slope per 40 feet of gutter. Attach brackets with 2" x #10 stainless wood screws.

B. Gutter Installation:
Install gutter from left to right (roofside into support brackets. Lap each telescoping section a distance of 1" seal and rivet at 2" on center. Nail or screw rear of gutter with 1-1/2" stainless fasteners.

C. Inside Strap Installation:
Install straps at 30" on center alternating with support brackets. Strap shall be hooked into leading edge of gutter and riveted at its rear side. Strap must not be fastened in a way that might restrain thermal movement.

D. Expansion Joints:
Install manufacturer's standard elastomeric expansion joint assembly, at 40'-0" intervals.

E. Miter Corners: Install manufacturer's welded miters at corners.

F. End Caps/Terminations:
Install manufacturer's end caps at all end terminations.

G. Outlets:
Field cut outlet hole in a neat workmanlike manner. Hole shall be located 1" from backside of gutter.

H. Downspouts:
Install downspouts at centers/locations per the drawings and building elevations. Utilize extruded or formed-closed type downspouts with thickness and finish as listed in this specification. Utilize the manufacturer's connecting sleeves at all joints.

1. When a surface water shed collection system is called for on the drawings, provide kick-out elbows at the termination base of each downspout at 45 or 75 degrees and provide concrete splash blocks at each downspout to control erosion.

2. When a subgrade water collection system is called for on the drawings, provide a direct tie-in to the underground roof drainage and collection system utilizing Piedmont Pipe stainless steel transition connectors in sizes called out on plans.

I. Wall Brackets:
Install manufacturer's wall brackets on downspouts at a maximum spacing of 5'. Secure to stucco with 1.5" stainless expansion fasteners. Fasten downspouts with (4) 1/8" x 3/8" pop-rivets per bracket.

J. Outlet Tubes:
Provide stainless steel outlet tubes at connections of gutters to downspouts with ½" flanges riveted in place with (4) 1/8" x 1/4" pop rivets. Hold downspouts 1" off of the wall.

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

SECTION 07715 - DRIP FLASHINGS

PART 1 - GENERAL

1.01 When called out on the plans the roof drip-edge and/or cap flashing for the building perimeters shall be a snap-lock system as manufactured by one of the following companies:

A. W.P. Hickman Company.

B. Architectural Products Company.

C. Metal-Era Roof Edge Systems.

D. Southern Aluminum Finishing Company.

E. MM Systems, Inc.

1.02 Provide a Manufacturers fifteen-year warranty. The roof edge system shall carry a Factory Mutual I-90 approval and shall meet a design wind uplift per ASCE 7-98.

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

PART 2 - MATERIAL

A. When Aluminum is called out on Details: The fascia shall be a minimum of .063 aluminum. The finish shall be clear anodized. Concealed splice plates shall match the color and finish. Provide galvanized spring clips. Provide fascia and clips in 10ft. lengths. Mitered corners shall be factory fabricated with welded joints. Coordinate with Roofing System Manufacturer's installation instructions before starting installation of drip edge system.

B. When Copper is called out on the Details: The fascia/cap flashing shall be bent to the configurations shown and be a minimum of 16-ounce copper. Concealed fasteners shall be non-corrosive, as recommended by the manufacturer of each material or system.

PART 3 - EXECUTION

A. Installation shall conform to manufacturers written instructions. The continuous spring clip shall be installed and fastened on the face at 12 inches on center with minimum 1-1/4 in. galvanized steel roofing nails. Secure as required by roofing system manufacturer. The fascia with concealed joint cover shall be installed with a downward snapping action. Installing contractor shall carefully cut and fit smaller intermediate sections of fascia to fit the building dimensions.

B. 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 10 feet for aluminum and 10 feet for copper. Conceal expansion provisions where possible.

C. 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.

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

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

F. Provide for thermal expansion and building movements.

*****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.

B. 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. 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

A. 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.

2. Clean porous joint substrate surfaces by brushing, grinding, blast cleaning, mechanical abrading, or a combination of these methods to produce a clean, sound substrate capable of developing optimum bond with joint sealants. Remove loose particles remaining after cleaning operations above by vacuuming or blowing out joints with oil-free compressed air. Porous joint substrates include the following:

   a. Concrete.
   b. Masonry.
   c. Unglazed surfaces of ceramic tile.

3. Remove laitance and form-release agents from concrete.
4. Clean nonporous surfaces with chemical cleaners or other means that do not stain, harm substrates, or leave residues capable of interfering with adhesion of joint sealants. Nonporous joint substrates include the following:

   a. Metal.
   b. Glass.
   c. Porcelain enamel.
   d. Glazed surfaces of ceramic tile.

B. Joint Priming: Prime joint substrates, where recommended in writing by joint-sealant manufacturer, based on preconstruction joint-sealant-substrate tests or prior experience. Apply primer to comply with joint-sealant manufacturer's written instructions. Confine primers to areas of joint-sealant bond; do not allow spillage or migration onto adjoining surfaces.

C. Masking Tape: Use masking tape where required to prevent contact of sealant with adjoining surfaces that otherwise would be permanently stained or damaged by such contact or by cleaning methods required to remove sealant smears. Remove tape immediately after tooling without disturbing joint seal.

3.3 INSTALLATION OF JOINT SEALANTS

A. General: Comply with joint-sealant manufacturer's written installation instructions for products and applications indicated, unless more stringent requirements apply.

B. Sealant Installation Standard: Comply with recommendations in ASTM C 1193 for use of joint sealants as applicable to materials, applications, and conditions indicated.

C. Acoustical Sealant Application Standard: Comply with recommendations in ASTM C 919 for use of joint sealants in acoustical applications as applicable to materials, applications, and conditions indicated.

D. Install sealant backings of type indicated to support sealants during application and at

position required to produce cross-sectional shapes and depths of installed sealants relative to joint widths that allow optimum sealant movement capability.

1. Do not leave gaps between ends of sealant backings.
2. Do not stretch, twist, puncture, or tear sealant backings.

3. Remove absorbent sealant backings that have become wet before sealant application and replace them with dry materials.

E. Install bond-breaker tape behind sealants where sealant backings are not used between sealants and backs of joints.

F. Install sealants using proven techniques that comply with the following and at the same time backings are installed:

1. Place sealants so they directly contact and fully wet joint substrates.
2. Completely fill recesses in each joint configuration.
3. Produce uniform, cross-sectional shapes and depths relative to joint widths that allow optimum sealant movement capability.

G. Tooling of Nonsag Sealants: Immediately after sealant application and before skinning or curing begins, tool sealants according to requirements specified below to form smooth, uniform beads of configuration indicated; to eliminate air pockets; and to ensure contact and adhesion of sealant with sides of joint.

1. Remove excess sealant from surfaces adjacent to joints.
2. Use tooling agents that are approved in writing by sealant manufacturer and that do not discolor sealants or adjacent surfaces.
3. Provide concave joint configuration per Figure 5A in ASTM C 1193, unless otherwise indicated.
4. Provide flush joint configuration where indicated per Figure 5B in ASTM C 1193.
5. Provide recessed joint configuration of recess depth and at locations indicated per Figure 5C in ASTM C 1193.

    a. Use masking tape to protect surfaces adjacent to recessed tooled joints.

H. Install sealants to size and shape shown on drawings, or, if not shown, with slightly concave surfaces.

a. The minimum opening should be 1/4".
b. The opening should be at least 4 times the maximum movement of the sealant.
c. The sealant should be more than 1/4" and less than 1/2" deep.
d. The depth of the sealant should be no greater than the width.
e. No joint to receive sealant should be less than 1/4" deep.

3.4 FIELD QUALITY CONTROL

A. Field-Adhesion Testing: Field test joint-sealant adhesion to joint substrates as follows:

1. Extent of Testing: Test completed elastomeric sealant joints as follows:

a. Perform 10 tests for the first 1000 feet (300 m) of joint length for each type of elastomeric sealant and joint substrate.

b. Perform 1 test for each 1000 feet of joint length thereafter or 1 test per each floor per elevation.

2. Test Method: Test joint sealants according to Method A, Field-Applied Sealant Joint Hand Pull Tab in Appendix X1 in ASTM C 1193, as appropriate for type of joint-sealant application indicated.

a. For joints with dissimilar substrates, verify adhesion to each substrate separately; do this by extending cut along one side, verifying adhesion to opposite side. Repeat procedure for opposite side.

3. Inspect joints for complete fill, for absence of voids, and for joint configuration complying with specified requirements. Record results in a field-adhesion-test log.

4. Inspect tested joints and report on the following:

a. Whether sealants in joints 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. Compare these results to determine if adhesion passes sealant manufacturer's field-adhesion hand-pull test criteria.

b. Whether sealants filled joint cavities and are free of voids.

c. Whether sealant dimensions and configurations comply with specified requirements.

5. Record test results in a field-adhesion-test log. Include dates when sealants were installed, names of persons who installed sealants, test dates, test locations, whether joints were primed, adhesion results and percent elongations, sealant fill, sealant configuration, and sealant dimensions.

6. Repair sealants pulled from test area by applying new sealants following same procedures used originally to seal joints. Ensure that original sealant surfaces are clean and that new sealant contacts original sealant.

B. Evaluation of Field Test Results: Sealants not evidencing adhesive failure from testing or noncompliance with other indicated requirements will be considered satisfactory. Remove sealants that fail to adhere to joint substrates during testing or to comply with other requirements. Retest failed applications until test results prove sealants comply with indicated requirements.

3.5 CLEANING

A. Clean off excess sealant or sealant smears adjacent to joints as the Work progresses by methods and with cleaning materials approved in writing by manufacturers of joint sealants and of products in which joints occur.

3.6 PROTECTION

A. Protect joint sealants during and after curing period from contact with contaminating substances and from damage resulting from construction operations or other causes so sealants are without deterioration or damage at time of Substantial Completion. If, despite such protection, damage or deterioration occurs, cut out and remove damaged or deteriorated joint sealants immediately so installations with repaired areas are indistinguishable from original work.

Architectural Applications	VOC Limit (g/L less water)	Specialty Applications	VOC Limit (g/L less water)
Indoor carpet adhesives	50	PVC welding	510
Carpet pad adhesives	50	CPVC welding	490
Wood flooring adhesives	100	ABS welding	325
Rubber floor adhesives	60	Plastic cement welding	250
Subfloor adhesives	50	Adhesive primer for plastic	550
Ceramic tile adhesives	65	Contact adhesive	80
VCT and asphalt adhesives	50	Special purpose contact adhesive	250
Drywall and panel adhesives	50	Structural wood member adhesive	140
Cove base adhesives	50	Sheet applied rubber lining operations	850
Multipurpose construction adhesives	70	Top and trim adhesive	250
Structural glazing adhesives	100		
Substrate Specific Applications	**VOC Limit (g/L less water)**	**Sealants**	**VOC Limit (g/L less water)**
Metal to metal	30	Architectural	250
Plastic foams	50	Roadway	250
Porous material (except wood)	50	Other	420
Wood	30		
Fiberglass	80		
Sealant Primers	**VOC Limit (g/L less water)**		
Architectural, nonporous	250		
Architectural, porous	775		
Other	750		
This table excludes adhesives and sealants integral to the water-proofing system or that are not building related.			

Aerosol Adhesives	VOC Limit
General purpose mist spray	65% VOCs by weight
General purpose web spray	55% VOCs by weight
Special purpose aerosol adhesives (all types)	70% VOCs by weight

*** END OF SECTION ***

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 08200 - WOOD DOORS

PART 1 - GENERAL

1.01 RELATED WORK SPECIFIED ELSEWHERE

A. Hollow Metal	Section 08100
B. Finish Hardware	Section 08700
C. Finish Carpentry	Section 06200
D. Painting	Section 09900

1.02 QUALITY ASSURANCE

Products of the following manufacturers or equal are acceptable:

A. Marshfield Door Systems, Inc. (Formerly Weyerhaeuser Company)
B. Eggers Industries, Architectural Door Division
C. Ipik Door Co., Inc.
D. VT Industries, Inc., Holstein, Iowa
E. OSHKOSH door company

1.03 SUBMITTALS

A. Product Data: Submit shop drawings indicating location and size of each door, elevation of each kind of door, details of construction, location and extent of hardware blocking, fire ratings, and other pertinent data.

B. Shop Drawings: Submit shop drawings indicating location and size of each door, elevation of each kind of door, details of construction, location and extent of hardware blocking, fire ratings, and other pertinent data.

C. Specific Product Warranty: Submit written agreement on door manufacturer's standard form signed by Manufacturer, Installer and Contractor, agreeing to repair or replace defective doors which have warped (bow, cup or twist) or which show telegraphing of core construction below in face veneers, or do not conform to tolerance limitations of NWMA and AWI.

1.04 PRODUCT DELIVERY, STORAGE AND HANDLING

A. Protect wood doors during transit, storage and handling to prevent damage, soiling and deterioration. Comply with the "On-Site Care" recommendations of NWMA pamphlet "Care and Finishing of Wood Doors" and with manufacturer's instructions, and as otherwise indicated.

B. Package doors at factory prior to shipping using manufacturer's standard method.

PART 2 - PRODUCTS

2.01 SOLID CORE DOORS (When called out on the Door Schedules)

A. 20 minute at interior locations and offices as indicated on plans. Provide 1-hour label at interior 1-hour rated fire partition assemblies and 1½ hour label at 2 hour rated fire partition assemblies as per the Life Safety Plans or Building Plans.

B. Standard: Meet or exceed NWMA Industry Standard I.S. 1-78 Series and Architectural woodwork Institute Type SLC and FD.

C. Veneer: paint grade, luan veneer, plain sliced, per door schedule.

D. Edge Band: Per manufacturers procedures.

E. Crossbands: Per manufacturers procedures.

F. Core: Staved hardwood lumber blocks bonded under pressure with 100% glue coverage; mineral core at label doors.

G. Glue: Type I (face assembly) and type II (core assembly).

H. Glass Lights and Louvers: Cut to size as indicated on drawings. Provide wood stops for glass light panels. All glass lights shall be clear 1/4" tempered glass or clear 1/4" safety laminate glass.

I. Guarantee: 10 Years, interior use only.

2.02 HOLLOW CORE DOORS (When called out on the door schedules)

A. Veneer: paint grade, luan veneer, plain sliced, per door schedule.

B. Edge Band: Per manufacturers procedures.

C. Crossbands: Per manufacturers procedures.

D. Glue: Type I (face assembly)

E. Guarantee: 10 Years, interior use only.

PART 3 - EXECUTION

3.01 INSPECTION

A. Verify that door frames are of type required and scheduled for the door and are installed as required for proper installation of doors.

PART 2 - PRODUCTS

2.01 SOLID CORE DOORS (When called out on the Door Schedules)

A. 20 minute at interior locations and offices as indicated on plans. Provide 1-hour label at interior 1 hour rated fire partition assemblies and 1 ½ hour label at 2 hour rated fire partition assemblies as per the Life Safety Plans or Building Plans.

B. Standard: Meet or exceed NWMA Industry Standard I.S. 1-78 Series and Architectural woodwork Institute Type SLC and FD.

C. Veneer: stain grade, natural birch, plain sliced, per door schedule.

D. Edge Band: Per manufacturers procedures.

E. Crossbands: Per manufacturers procedures.

F. Core: Staved hardwood lumber blocks bonded under pressure with 100% glue coverage; mineral core at label doors.

G. Glue: Type I (face assembly) and type II (core assembly).

H. Glass Lights and Louvers: Cut to size as indicated on drawings. Provide wood stops for glass light panels. All glass lights shall be clear 1/4" tempered glass or clear 1/4" safety laminate glass.

I. Guarantee: 10 Years, interior use only.

2.02 HOLLOW CORE DOORS (When called out on the door schedules)

A. Veneer: stain grade, natural birch, plain sliced, per door schedule.

B. Edge Band: Per manufacturers procedures.

C. Crossbands: Per manufacturers procedures.

D. Glue: Type I (face assembly)

E. Guarantee: 10 Years, interior use only.

PART 3 - EXECUTION

3.01 INSPECTION

A. Verify that door frames are of type required and scheduled for the door and are

installed as required for proper installation of doors.

B. Do not install doors in frames which would hinder operation of doors.

C. Do not remove labels from rated doors or cover with paint.

3.02 INSTALLATION

A. Fitting and machining:

1. Fit doors for width by planing; for height by sawing.
   a. ½" from bottom (3/16 over threshold, saddle or carpet)
   b. 1/8" maximum frame top and sides.
   c. Bevel lock and hinge edges 1/8" to 1/2".

2. Machine doors for hardware.

3. Cut light and louver openings in door not exceeding maximum 40% of height and 5" from door edge.

4. Seal all job site cut surfaces with two coats of paint or polyurethane before final hanging.

B. Installation of Doors: Install in accordance with requirements of NWMA Standard Door Guarantee, and manufacturer's instructions.

C. Install fire rated doors in corresponding fire rated frames in accordance with requirements of NFPA No. 80.

D. Finishing: Door shall be field painted or polyurethane finished, per Interior Finish Schedule and in accordance with Section 09900, PAINTING.

3.03 ADJUST AND CLEAN

A. Replace or re-hang doors which are hinge bound and do not swing or operate freely.

B. Replace doors damaged during the construction period and those with visible glue spots.

C. Refinish or replace doors damaged during installation. No visible runs of paint or polyurethane will be accepted.

D. Replace doors that are warped and that pull away from door stops.

E. Adjust all pocket doors so that door faces do not rub jambs or frames, and the

doors hang plumb in the openings. All pocket doors shall utilize 5-1/2" frames and have steel frame stiffeners to prevent frame distortion.

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

SECTION 08400 - ENTRANCE STOREFRONT DOORS

PART 1 - GENERAL

A. All entrance system materials are to be provided by one manufacturer. Entrances shall be wide OR medium stile doors as detailed on the architectural drawings and as manufactured to the design and specifications of one of the following manufacturers:

Arch Aluminum & Glass Co.
Kawneer Corporation
U.S. Aluminum
Frontline Aluminum
SMI Corporation
PGT Windows and Doors
Envirolume Windows and Doors, Inc.

All adjacent framing, sidelites and fixed lites shall be of system shown, or approved equal, and where specified and designed as an exterior door assembly, shall be impact rated per FBC 2014 Fifth Edition and ASCE 7-10.

PART 2 - SPECIFICATIONS (NOTE: See Door Schedule for Sizes and manufacturers)

A. Wide Stile doors, when scheduled, shall be composed of tubular extrusions with 5" stiled and 5" top rail and 7-1/2" bottom rail. Corners shall have reinforcing plates, extruded anti-twist guides with mortise joinery and full width 3/8" plated steel tension rods.

B. Medium Stile doors, when scheduled, shall be composed of tubular extrusions with 3-1/2" stiles and a 3-1/2" top rail and 5" bottom rail. Corners shall have reinforcing plates, extruded anti twist guides with mortise joinery and full width 3/8" plated steel tension rods.

C. Glazing beads shall be an integral sash, non-removal from the exterior with vinyl bulb inserts for dry glazing. Glazing beads for insulated glass are available. Minimum bite on tempered glass shall be 1/2" in door leafs and fixed lite transoms.

D. All aluminum components shall be of 6063 alloy with T-5 temper. All screws shall be of plated steel. All steel in contact with aluminum shall be plated or painted.

PART 3 - HARDWARE

A. Arch's standard hardware shall consist of AR-800 pull handles and H-2 push bars with 1-1/2 pair Hager #23439, 4-1/2" brass butt hinges or offset cast aluminum pivot hinges international #OP-160 at each end and intermediate cast aluminum

hinges #IP-1900 at midspan of each leaf. Door hardware schedule per each approved manufacturer takes precedence over this description.

B. Locks: two point concealed vertical rod panic hardware in door pairs.
C. Please be advised that the door manufacturer should provide all entrance hardware. Refer to the Door Hardware Schedule Section 08710 for a complete description. In the event that hardware is to be provided by others, such hardware specification must be received by the Storefront Manufacturer before fabrication of doors can begin.

PART 5 - FASTENERS

A. Typical anchors:
   1. Into P.T. wood bucks or wood structure, #14 SMS with 1-1/2"minimum total embed at spacings to comply with manufacturer's NOA data.
   2. Through P.T. 1X wood bucks and into masonry, 1/4" dia. Tapcons with 1-1/4" minimum embed into masonry at spacings to comply with manufacturer's NOA data.

NOTE: All wood bucks provided by the general contractor must sustain the loads imposed by the glazing system and transfer them to the building structure.

PART 6 - FINISH

A. All exposed surfaces shall be free from unsightly scratches and blemishes. Aluminum sections shall be coated with one of the following options:

   1. Anodized material: shall be given a caustic etch followed by an anodic oxide treatment. Color shall be one of the following and per the door schedule on the plans:

a) Dark Bronze	AA	M12	C22	A42/44
b) Medium Bronze	AA	M12	C22	A40
c) Clear	AA	M12	C22	A21
d) Black	AA	M12	C22	A44

   2. Powder coated material, when called out on the door schedule, shall be given an acidic wash and etch and coated with one of the following:

      a) ARCHKOTE 1000 – 1 YEAR WARRANTY MEETS OR EXCEEDS AAMA 603.8-85
      b) ARCHKOTE 6000 – 6 YEAR WARRANTY MEETS OR EXCEEDS AAMA 605.2-85

   3. The option and color selected for this project is: **NEW GATES TO COLOR MATCH WITH EXISTING ADJACENT METAL FENCING**

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

SECTION 08410 - FLUSH GLAZED STOREFRONT WINDOWS

PART 1 - GENERAL

A. Store front framing shall be impact rated and detailed on the Architectural drawings and as manufactured to the design and specifications of one of the following or an approved equal:

Arch Aluminum & Glass Company
Kawneer
U.S. Aluminum
Frontline Aluminum

Storefront glazing systems vary with each project. Refer to plans and details for flush glazed and curtain wall systems required.

PART 2 - SPECIFICATIONS

A. The Framing System shall have a maximum face dimension of 2.50" and a maximum depth of 5" for both vertical and horizontal members. (Section profiles may vary w/manufacturer). All sections shall be of extruded aluminum alloy 6063 and a T5 temper. Glazing Gaskets shall be of EPDM or pvc extrusions. Assembly screws shall be of plated steel. Glass shall have a minimum bite of 5/8" on the perimeter. Glass types and SHGC requirements shall be as defined on the window schedule. **All storefront framing and glass assemblies shall be impact rated.** (Refer to Window Schedule to determine if single glazed, insulated or a combination of both).

PART 3 - FINISH

A. All exposed surfaces shall be free from unsightly scratches and blemishes. Aluminum sections shall be coated with one of the following options:

1. Anodized material: shall be given a caustic etch followed by an anodic oxide treatment. Color shall be:

a) Dark Bronze	AA	M12	C22	A42/44
b) Medium Bronze	AA	M12	C22	A40
c) Clear	AA	M12	C22	A21
d) Black	AA	M12	C22	A44

2. Powder coated material shall be given an acidic wash and etch and coated with one of the following:
   a) ARCHKOTE 6000 – 6-YEAR WARRANTY MEETS OR EXCEEDS AAMA 605.2-85
   b) TIGER DRYLAC – SERIES 19, 6-YEAR WARRANTY

B. The option and color selected for this project is: **COLOR MATCH TO BE DETERMINED.**

PART 4 - ERECTION

A. The Storefront Glazing System specified shall be installed, in properly prepared openings, level, plumb and in alignment and consistent with acceptable erection techniques and practices. Frames shall be secured to the walls/jambs with approved fasteners to comply with manufacturer's NOA data.

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

Door/Hardware Index

LOCKER

Door #	HWSet #
01	2
02	6
03	6
04	4
05	5
06	5
07	8

MUSIC

Door #	HWSet #
01M	1
02M	1
03M	3
04M	7

SpeXtra: 315128

Hardware Group No. 1

For use on mark/door #(s):
01M 02M

Provide each SGL door(s) with the following:

Qty		Description	Catalog Number	Finish	Mfr
1	EA	CYLINDER	1080-114-A02 CT6	626	C-R
1	EA	PERMANENT CORE	8000-6	626	C-R
			BALANCE OF HARDWARE BY DOOR MANUFACTURER		

Hardware Group No. 2

For use on mark/door #(s):
01

Provide each SGL door(s) with the following:

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 CT6G	626	C-R
2	EA	PERMANENT CORE	8000-6	626	C-R
1	EA	SURFACE CLOSER	4040XP EDA ST-1944	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
1			SEALS BY DOOR SUPPLIER		

Operational Description
Self-Closing.

Hardware Group No. 3

For use on mark/door #(s):
03M

Provide each SGL door(s) with the following:

Qty		Description	Catalog Number	Finish	Mfr
3	EA	HW HINGE	5BB1HW 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	689	LCN
1	EA	KICK PLATE	8400 8" X 2" LDW	630	IVE
1	EA	WALL STOP	WS402CVX	626	IVE
3	EA	SILENCER	SR64	GRY	IVE

Operational Description
Self-Closing.

Hardware Group No. 4

For use on mark/door #(s):
04

Provide each SGL door(s) with the following:

Qty		Description	Catalog Number	Finish	Mfr
3	EA	HINGE	5BB1 4.5 X 4.5 NRP	630	IVE
1	EA	DORMITORY LOCK	ML2065 NSA CT6B	626	C-R
1	EA	PERMANENT CORE	8000-6	626	C-R
1	EA	SURFACE CLOSER	4040XP SCUSH ST-1944	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
1			SEALS BY DOOR SUPPLIER		

Operational Description
Self-Closing. Templating allows Spring CUSH Arm to stop the door's swing between 85 and 110 degrees.

Hardware Group No. 5

For use on mark/door #(s):
05 06

Provide each SGL door(s) with the following:

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	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
1			SEALS BY DOOR SUPPLIER		

NOA 15-0427.04 IN-SWING

Operational Description
Self-Closing.

Hardware Group No. 6

For use on mark/door #(s):
02 03

Provide each SGL door(s) with the following:

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	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

Operational Description
Self-Closing.

Hardware Group No. 7

For use on mark/door #(s):
04M

Provide each PR door(s) with the following:

Qty		Description	Catalog Number	Finish	Mfr
6	EA	HINGE	5BB1 4.5 X 4.5 NRP	652	IVE
2	EA	MANUAL FLUSH BOLT	FB458	626	IVE
1	EA	DUST PROOF STRIKE	DP2	626	IVE
1	EA	MORTISE LOCK	ML2059 NSA CT6	626	C-R
1	EA	PERMANENT CORE	8000-6	626	C-R
2	EA	SURFACE CLOSER	4040XP	689	LCN
2	EA	KICK PLATE	8400 8" X 1 1/2" LDW	630	IVE
2	EA	WALL STOP	WS402CVX	626	IVE
2	EA	SILENCER	SR64	GRY	IVE
1	EA	ASTRAGAL	Z BY MFG		STE

Operational Description
Self-Closing.

Hardware Group No. 8

For use on mark/door #(s):
07

Provide each SGL door(s) with the following:

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

STOREROOM LOCK

Operational Description: Self-Closing. Templating allows CUSH Arm to stop the door's swing between 85 and 110 degrees with hold-open feature.

Door/Hardware Index

Door #	HWSet #
01	3
02	3
03	4
04	5
27	2
G11G12	1
G13G14	1
G15G16	1
G17G18	1
G19G20	1
G1G2	1
G21G22	1
G23G24	1
G25G26	1
G3G4	1
G5G6	1
G7G8	1
G9G10	1

SpeXtra: 315128

Hardware Group No. 1

For use on mark/door #(s):

G11G12	G13G14	G15G16	G17G18	G19G20	G1G2
G21G22	G23G24	G25G26	G3G4	G5G6	G7G8
G9G10					

Provide each PR Gates(s) with the following:

Qty		Description	Catalog Number	Finish	Mfr
2	EA	PANIC HARDWARE	98-L-06-WH	626	VON
2	EA	CYLINDER	3080 CT6	626	C-R
2	EA	PERMANENT CORE	8000-6	626	C-R
			BALANCE OF HARDWARE BY GATE MANUFACTURER		

Operational Description
Free Egress at all times. Pressing Push Bar retracts latchbolts. Latchbolt retracted by lever unless locked by key. Key locks and unlocks lever. Dogging by hex key, locks down the pushbar or crossbar so the latchbolt remains retracted.

Hardware Group No. 2

For use on mark/door #(s):
27

Provide each SGL door(s) with the following:

Qty	Description	Catalog Number	Finish	Mfr
		RE-USE EXISTING HARDWARE		

Hardware Group No. 3

For use on mark/door #(s):
01 02

Provide each SGL door(s) with the following:

Qty		Description	Catalog Number	Finish	Mfr
1	EA	MORTISE CYLINDER	1080-114-A03 CT6	626	C-R
1	EA	PERMANENT CORE	8000-6	626	C-R
			BALANCE OF HARDWARE BY DOOR MANUFACTURER		

Hardware Group No. 4

For use on mark/door #(s):
03

Provide each SGL door(s) with the following:

Qty		Description	Catalog Number	Finish	Mfr
3	EA	HW HINGE	5BB1HW 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	689	LCN
1	EA	KICK PLATE	8400 8" X 2" LDW	630	IVE
1	EA	WALL STOP	WS402CVX	626	IVE
3	EA	SILENCER	SR64	GRY	IVE

Operational Description
Self-Closing.

Hardware Group No. 5

For use on mark/door #(s):
04

Provide each PR door(s) with the following:

Qty		Description	Catalog Number	Finish	Mfr
6	EA	HINGE	5BB1 4.5 X 4.5 NRP	652	IVE
2	EA	MANUAL FLUSH BOLT	FB458	626	IVE
1	EA	DUST PROOF STRIKE	DP2	626	IVE
1	EA	MORTISE LOCK	ML2059 NSA CT6	626	C-R
1	EA	PERMANENT CORE	8000-6	626	C-R
2	EA	SURFACE CLOSER	4040XP	689	LCN
2	EA	KICK PLATE	8400 8" X 1 1/2" LDW	630	IVE
2	EA	WALL STOP	WS402CVX	626	IVE
2	EA	SILENCER	SR64	GRY	IVE
1	EA	ASTRAGAL	Z BY MFG		STE

Operational Description
Self-Closing.

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 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 09510 - LAY IN PANEL CEILINGS (See schedule on drawings)

A. GENERAL

1. Acceptable Manufacturers:

   a. Grid System: Chicago Metallic Corporation
      Donn Corporation
      U.S. Gypsum Corp.
      W.J. Haertel Division; Leslie-Locke
      National Rolling Mills Company
      Armstrong Ceilings

   b. Lay-in-Panels: Celotex
      Armstrong
      Conwed
      U.S. Gypsum

2. Product delivery storage and handling: Store materials in protective packaging to prevent soiling or physical damage.

B. PRODUCTS

1. Lay-in Panels: **As per the Suspended Acoustic Tile Schedule on the plans,** utilizing the manufacture's product scheduled or an approved equal.

2. Grid Systems: With all components conforming to the requirements of ASTM C-635 in a low-sheen, baked-on white enamel finish or in a color and material to be selected by the Architect. See the plans for a complete description.

3. Perimeter Molding: Channel formed, of not less than 22-gauge steel, 1" horizontal exposed face with exposed edge hemmed; low sheen, baked-on white enamel finish or in a color to be selected by Architect.

4. Suspension System:
   a. Hangers: Annealed zinc-coated wire #12 gauge or heavier.
   b. Carrying Channels: 1-1/2" x 3/4 x #16 gauge for greater spans.

C. EXECUTION

1. Condition of Surfaces: Examine surfaces scheduled to receive suspended or directly attached lay in panels for unevenness, irregularities that would affect quality or execution of work. Install ceiling system in strict accordance with the manufacturers printed specifications.
2. Cleaning: Clean soiled units after installation.
3. Remove and replace damaged or improperly installed units.

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

SECTION 09730 – SEAMLESS EPOXY FLOORING

PART 1 GENERAL

1.01 SCOPE

A. Provide all labor and materials for a seamless, decorative, epoxy flooring material, including all surface preparation, primers, and finish coats.
B. Related work specified elsewhere:
   1. Concrete - Division 3
   2. Thermal & Moisture Protection - Division 7

1.02 ACCEPTABLE MANUFACTURER AND INSTALLER

A. DUR-A-FLEX, Inc.
   CRAWFORD LAB FLO-ROCKS
   CROSSFIELD PROD. CORP. DEX-O-TEX
   SELBY SELBACLAD
   STONEHARD, Inc. STONESHIELD HRI
   VALSPAR Corp: QUARTSITE
B. Installer shall be a manufacturer's approved installer, who has the technical qualifications, current and certified in writing, and the facilities to install the specified systems.

1.03 DELIVERY AND STORAGE

A. Material shall be delivered to job-site in clean, clearly labeled containers and inspected by installer prior to start of the job.
B. Material shall be stored in a dry, enclosed area protected from the elements. Temperatures of storage area shall be kept between 60 degrees and 90 degrees F.

1.04 ENVIRONMENTAL REQUIREMENTS

A. New concrete shall be cured no less than 28 days under good conditions. Concrete subfloors on or below grade shall be properly equipped with vapor barriers and perimeter drains.
B. Adequate utilities, including electric, water, heat (between 60 degrees and 90 degrees F.) and lighting of no less than 80 ft. Candles measured at floor surface to be supplied by the General Contractor.

Specifier Note: Heat and light are extremely important parts of the installation. Usually these utilities are functioning before epoxy finishes are scheduled for installation, however in some cases the epoxy coating shall be installed prior to equipment, fixtures and even walls in some cases. Lack of these necessities can and will spoil a good installation. Without heat the curing process can be extended or even stopped. Without adequate light even the best mechanic cannot provide a

quality finish.

C. Work area shall be free of other trades during, and for a period of 24 hours, after floor installation.
D. Protection of finished floor from damage by subsequent trades is the responsibility of the General Contractor.

1.05 WARRANTY

A. Contractor to submit a (one) year warranty against defects in materials and workmanship upon acceptance of the finished product and Certificate of Occupancy by the Owner.

PART 2 PRODUCTS

2.01 PRODUCT DESCRIPTION

A. The installed product **shall be 3/16" thick** DUR-A-QUARTZ multiple-component, decorative, institutional flooring system, by DUR-A-FLEX, Inc., or an approved equal in **standard non-skid** surface texture.

2.02 PHYSICAL PROPERTIES

A. Physical Properties - (DUR-A-QUARTZ "BM" EPOXY FLOORING)
Mix Ratio (Dur-A-Glaze #4).1 part Hardener, 2 parts Resin.
Pot Life....Approximately 22 minutes at 70 degrees F*.
Hardness, Shore D....ASTM D-2240...75-80.
Compressive Strength...ASTM D-695...17,500 psi.
Tensile Strength...ASTM F-638...4,000 psi.
Tensile Elongation....ASTM D-638...7.5%.
Flexural Strength...ASTM D-790...6,250 psi.
Linear Shrinkage....ASTM D-2566...0.02%.
Coefficient of Linear Expansion...12 degrees F. to 140 degrees F.
In./in./degrees F....ASTM D-696...20 X 10-6.
Bond Strength to Concrete....ACI-403...335 psi, concrete fails.
Shear from Steel Plate....MIL D-3134...no cracking or delamination.
Indentation....MIL D-3134...025.
Impact Resistance...MIL D-3134...no cracking or delamination.
Elevated Temperature...MIL D-3134...no slip or flow.
Water Absorption....ASTM D-570...0.04%.
Electrical Conductivity....non-conductive.
Flammability....ASTM D-635...self-extinguishing.
Abrasion Resistance Taber Abrader...CS-17 wheels, 2000 gm. Load, 1000 cycles...avg. 24.0 mg. loss.
Toxicity....non-toxic, USDA approved.

* Pot Life is shorter at higher temperatures. Do not use below 50 degrees F. or above 95 degrees F. Note: Chemical & stain resistance can be improved by using Poly-Thane #2 as a topcoat(s). Scratch resistance can be improved by using Dur-A-Thane or Dur-A-Glaze #2 as a topcoat(s).

2.2 PRODUCT PACKAGING

A. All materials used shall be precision mixed on site with manufacturer supplied mix and measure apparatus to ensure a timely, accurate mix ratio and minimize waste.

PART 3 EXECUTION

3.01 PREPARATION

A. Concrete preparation to include use of a steel shotblast machine or a solution of muriatic acid to create a profiled substrate, combined with "dust-free" diamond grinding for all edges and areas where shotblast machine is unable to reach.

Specifier Note: For maximum bond strength, steel shotblasting is always recommended.

3.02 PRODUCT INSTALLATION

A. COLORS: Q28 Colored Quartz Aggregate is available in 21 standard colors. As selected by Architect.

B. THICKNESS: 1/8" for moderate traffic i.e.: corridors, 3/16" thick for heavy traffic ie: restroom and kitchens, or to fill and level eroded concrete. See Article 2.01 for thickness required for this project.

C. LIMITATIONS: Substrate and ambient temperature must be higher than 50 degrees F during the installation and curing period. Eroded or spalled areas must be "filled and leveled" with an epoxy grout composed of Dur-A-Glaze #4 and aggregate.

D. SURFACE PREPARATION: Surface must be dry and perfectly clean, free of all oil, grease, detergent film, sealers and/or curing compounds in accordance with Dur-A-Flex, Inc., preparation guidelines.

E. APPLICATION PROCEDURE and SPREAD RATES: Troweled application and broadcast is acceptable or a Double Broadcast application is acceptable with either yielding a uniform appearance. Either application must achieve the specified 1/8" to 3/16" thickness called out in Article 2.01.
Procedure is as follows:
1. Prepare the surface as recommended.
2. Apply Dur-A-Glaze #4 at approximately 100 sq. Ft. per gallon.

3. Broadcast Q28 Colored Quartz at approximately ½ lb. per sq. foot.
4. Let cure. (Cure times vary depending on hardener selection, from 2 to 10 hours.)
5. Sweep up excess sand.
6. Apply Dur-A-Glaze #4 at approximately 100 sq. ft. per gallon. This application serves as a base coat for a second broadcast.
7. Broadcast Q28 Colored Quartz at approximately ½ lb. per sq. foot.
8. Repeat steps 4 & 5.
9. Apply first top coat of Dur-A-Glaze #4 at 100-125 sq.ft. per gallon.
10. Let Cure.
11. Apply second topcoat of Dur-A-Glaze #4 at 200-250 sq.ft. per gallon, or any Dur-A-Flex high performance topcoat such as Poly-Thane #2, Dur-A-Thane or Dur-A-Glaze #2 at 200-300 sq. ft. per gallon.

NOTE: One top coat is generally sufficient where a high degree of non-skid is required such as a shower room. For shower and bathroom installations, provide only one coat of top coat material to insure a **non-skid** surface.

3.03 DETAILS

A. Moving cracks and joints shall be thoroughly routed and vacuumed clean, then filled with DUR-A-FILLER #2.
B. Surface deviations to be pre-patched with patching compound comprised of DUR-A-GLAZE #4 and No-Sag #2 or Q28 Quartz.
C. A **4" integral cove base** is to be installed at perimeter walls.
D. Prime surface with Elast-O-Coat membrane as per manufacturer's recommendations.

*****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 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), **Jade SC-523** 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. **Jade SC-523** 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: **Indian River County School District Music Building**

Item # 1
Sign type "A" / **STORAGE B-125, INSTRUMENT STORAGE B – 107.**

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*****