

PROJECT MANUAL

Including Specifications
For construction of

MUTUAL AID STAGING AND COORINATION FACILITY

TALQUIN ELECTRIC COOPERATIVE, INC.

30270 Blue Star Highway Gadsden County, Florida

Prepared by

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PROJECT DIRECTORY

000103

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END OF PROJECT DIRECTORY

PROJECT DIRECTORY

000103-1

TABLE OF CONTENTS
000110

Division 0 – Bidding and Contract Requirements:

000101	Cover page
000103	Project Directory
000110	Table of Contents
000800	Supplementary Conditions

Division 1 – General Requirements:

010015	Use of the Premises
010450	Cutting and Patching
011520	Applications for Payment
012010	Preconstruction Conference
013400	Submittals and Substitutions
013700	Schedule of Values
014100	Testing Laboratory Services
015000	Temporary Facilities and Controls
016400	Product Handling
017000	Contract Closeout
017100	Cleaning
017200	Project Record Documents
017300	Operation and Maintenance Data
017400	Warranties

Division 2 – Site work:

Refer to Civil Drawing Package	
022810	Termite Control
023000	Subsurface Conditions

Division 3 - Concrete:

Refer to Structural Drawings.	
033520	Colored Concrete Finishing

Division 4 – Masonry:

Refer to Drawings

Division 5 – Metals

Refer to Drawings

Division 6 – Wood & Plastics

062000	Finish Carpentry
064050	Cabinets and Fixtures

Division 7 – Thermal & Moisture Protection

072100	Building Insulation
074000	Metal Roofing and Wall Panels

075400	Mechanically Attached TPO Roofing
076200	Flashing and Sheet Metal
079200	Sealants and Caulking

Division 8 – Doors & Windows

081113	Metal Doors and Frames
081416	Wood Doors
083300	Insulated Rolling Service Door
083301	Hurricane Protection Rolling Doors
083310	Rolling Counter Shutters
084213	Wind & Impact Security Aluminum Entrances
085653	Wind & Impact Security Windows
087100	Finish Hardware
088000	Glazing

Division 9 - Finishes:

092216	Metal Stud System
092600	Gypsum Wallboard System
093100	Decorative Tile
095100	Acoustical Ceiling
096500	Resilient Flooring
096813	Carpeting
099000	Painting

Division 10 – Specialties

101400	Identifying Devices
102113	Toilet Partitions
102226	Operable Wall Partitions
102800	Toilet Room Accessories
107500	Flagpoles

Division 11 – 14 Not Used

Division 15 – MECHANICAL

Refer to Drawings

Division 16 - ELECTRICAL

Refer to Drawings

END OF TABLE OF CONTENTS

008000

SUPPLEMENTARY CONDITIONS

The following are additional items required for the project.

1. Supplement and/or modify insurance requirements in the agreement as follows:
 - A. Contractor's Insurance: The contractor shall not commence any work in connection with this Agreement until he has obtained all of the following types of insurance 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. All insurance policies shall be with Insurers qualified and doing business in Florida.
 - B. Worker's Compensation Insurance: The Contractor shall take out and maintain, during the life of this Agreement, Worker's Compensation Insurance for all of the Contractor's employees connected with the work of this project and, in case any work is sublet, the Contractor shall require the subcontractor similarly to provide Worker's Compensation Insurance for all of the latter's employees, unless such employees are covered by the protection afforded by the Contractor. Such insurance shall comply fully with the Florida Worker's Compensation Law, Chapter 440, Florida Statutes. In case any class of employees engaged in hazardous work under this contract at the site of the project is not protected under the Workmen's Compensation statute, the Contractor shall provide, and cause each subcontractor to Provide, adequate insurance, satisfactory to the Owner, for the protection of his employees not otherwise protected.
 - C. Contractor's Public Liability and Property Damage Insurance: The Contractor shall take out and maintain during the life of this Agreement COMPREHENSIVE GENERAL LIABILITY, COMPREHENSIVE AUTOMOBILE LIABILITY, CONTRACTUAL LIABILITY AND PRODUCTS AND COMPLETED OPERATIONS LIABILITY INSURANCE. These Policies shall protect him from claims for damage for personal injury, including accidental death, as well as claims for property damages, which may arise from operations under this Agreement whether such operations are by himself or by anyone directly, or indirectly employed by him. The amounts of such insurance shall be the minimum limits as follows:
 - 1) Bodily Injury Liability: \$1,000,000/claimant
\$2,000,000/occurrence
 - 2) Personal Injury Liability: \$1,000,000/claimant
\$2,000,000/occurrence
 - 3) Automobile Bodily Injury
& Property Damage
Liability: \$1,000,000 CSL
 - 4) Property Damage Liability:
(other than automobile) \$1,000,000/claimant
\$2,000,000/occurrence
 - D. Subcontractor's Public Liability and Property Damage Insurance: The Contractor shall require each of his subcontractors to procure and maintain during the life of

SUPPLEMENTARY CONDITIONS

008000-1

this subcontract, insurance of the types specified above or insure the activities of his subcontractors in his policy as specified above.

- E. Owner's Protective Liability Insurance: The Contractor shall procure and furnish an Owner's Protective Liability Insurance Policy with the following minimum limits:
- 1) Bodily Injury Liability: \$1,000,000/claimant
\$2,000,000/occurrence
 - 2) Property Damage Liability: \$1,000,000/claimant
\$2,000,000/occurrence
 - 3) Personal Injury Liability: \$1,000,000/claimant
\$2,000,000/occurrence
- F. Explosion, Collapse, Underground Damage: The Contractor's Liability Policy shall provide "XCU" coverage for those classifications in which they are excluded.
- G. Contractual Liability Work Contracts: The Contractor's Liability Policy shall cover such contracts when they are affected. Broad Form Property Damage shall be provided to extend completed operations coverage to work performed by the contractor.
- H. Fire and Extended Coverage Insurance: The Contractor shall take out and maintain during the life of this Contract a **"Builder's Risk Policy"** with fire and extended coverage and vandalism and malicious mischief coverage, completed value form.
- I. Certificates of Insurance: The Owner shall be furnished proof of coverage of insurance as follows:
- 1) Certificates of Insurance shall be furnished by the Contractor to the Owner. These shall be completed and signed by the authorized Resident Agent. This certificate shall be dated and show:
 - a. The name of the insured contractor, the specific job by name and job number, the name of the insurer, the number of the policy, its effective date, and its termination date.
 - b. Statement that the Insurer will mail notice to the Owner and a copy to the Architect at least fifteen days prior to any material changes in provisions or cancellation of the Policy.
 2. The Contractor shall submit claims for delays due to adverse weather conditions affecting progress of the work on a monthly basis and submit the required documentation for such claim with the application for payment for that month in which the claim is being made. Any provisions for earlier notice of a potential or real delay shall be as required in the contract.
 3. A Project Contingency in the amount of \$150,000.00 shall be included in the Base Bid amount provided by the bidder. The bidder shall be responsible for this cost as part of the total bid. This cost shall be an amount set aside for potential unforeseen or additional items that may be required or requested during the course of the construction project, and may only be utilized by agreement in writing between the Owner and Contractor with the recommendation of the Architect for specific additions to the scope of Work. If the total amount is not designated and utilized, then a Change Order for the balance shall be created crediting that balance back to the Owner at the end of the project.

Note to bidder: the Project Contingency amount shall be included in the Base Bid, and is intended to not be increased by an overhead and profit cost. An overhead and profit amount shall be allowed to be added when and if the Project Contingency amount gets utilized on the project. The proper allowance for overhead and profit shall be as defined above under number 4 in the same fashion as a Change Order.

END OF SUPPLEMENTARY CONDITIONS

DIVISION 1
GENERAL REQUIREMENTS

SECTION 010015

CONTRACTOR'S USE OF THE PREMISES

PART 1 - GENERAL

1.1 DESCRIPTION

- A. Work included: This Section applies to situations in which the Contractor or his representatives including, but not necessarily limited to, suppliers, subcontractors, employees, and field engineers, enter upon the Owner's property.
- B. Related work:
 - 1. Documents affecting work of this Section include, but are not necessarily limited to, General Conditions, Supplementary Conditions, and Sections in Division I of these Specifications.

1.2 QUALITY ASSURANCE

- A. Promptly upon award of the Contract, notify all pertinent personnel regarding requirements of this Section.
- B. Require that all personnel who will enter upon the Owner's property certify their awareness of and familiarity with the requirements of this Section.

1.3 SUBMITTALS

- A. Maintain an accurate record of the names and identification of all persons entering upon the Owner's property in connection with the Work of this Contract, including date and times of entering and times of leaving, and submit a copy of the record to the Owner.

1.4 TRANSPORTATION FACILITIES

- A. Truck and equipment access:
 - 1. To avoid traffic conflict with vehicles of the Owner's employees, and to avoid traffic conflict on adjacent streets, limit the access of trucks and equipment to areas coordinated with the Owner for parking and equipment storage.
 - 2. Provide adequate protection for curbs and sidewalks over which trucks and equipment pass to reach the job site.
- B. Contractor's vehicles:
 - 1. Require Contractor's vehicles, vehicles belonging to employees of the Contractor, and all other vehicles entering upon the Owner's property in performance of the Work of the Contract, to use only those areas approved by the Owner for such use.

1.5 PROTECTION AND REPAIR OF PROPERTY

- A. Provide all means of protection for existing curbing, pavement, existing mature trees designated by the architect, and other elements not shown to be removed.

- B. Upon completion of the work of this project, inspect all areas utilized by the Contractor for storage, fabrication, and/or vehicular access and parking for damage. Repair to the Owner's approval all areas damaged by the work of this project.

1.6 COORDINATION OF THE WORK

- A. Work required under various other sections of these specifications, ie. Temporary Controls, shall be reviewed with the Owner for the effect on time of commencement, duration and time of day during which the work is to be accomplished.
- C. The required area for Contractors and subcontractors use for stored material, field fabrications and office trailer location shall be determined during the "Preconstruction Conference"

END OF SECTION

SECTION 010450

CUTTING AND PATCHING

PART 1 - GENERAL

1.1 DESCRIPTION

- A. Work included: This Section establishes general requirements pertaining to cutting (including excavating), fitting, and patching of the Work required to:
 - 1. Make the several parts fit properly;
 - 2. Uncover work to provide for installing, inspecting, or both, of ill-timed work;
 - 3. Remove and replace work not conforming to requirements of the Contract Documents; and
 - 4. Remove and replace defective work.
- B. Related work:
 - 1. Documents affecting work of this Section include, but are not necessarily limited to, General Conditions, Supplementary Conditions, and Sections in Division I of these Specifications.
 - 2. Mechanical Drawing Provisions
 - 3. Electrical Drawing Provisions
 - 4. In addition to other requirements specified, upon the Architect's request uncover work to provide for inspection by the Architect of covered work, and remove samples of installed materials for testing.
 - 5. Do not cut or alter work performed under separate contracts without the Architect's written permission.

1.2 QUALITY ASSURANCE

- A. Use adequate numbers of skilled workmen who are thoroughly trained and experienced in the necessary crafts and who are completely familiar with the specified requirements and the methods needed for proper performance of the work of this Section.

1.3 SUBMITTALS

- A. Request for Architect's consent:
 - 1. Prior to cutting which effects structural safety, submit written request to the Architect for permission to proceed with cutting.
 - 2. Should conditions of the Work, or schedule, indicate a required change of materials or methods for cutting and patching, so notify the Architect and Secure his written permission and the required Change Order prior to proceeding.

B. Notices to the Architect:

1. Prior to cutting and patching performed pursuant to the Architect's instructions, submit cost estimate to the Architect. Secure the Architect's approval of cost estimates and type of reimbursement before proceeding with cutting and patching.
2. Submit written notice to the Architect designating the time the Work will be uncovered, to provide for the Architect's observation.

PART 2 - PRODUCTS

2.1 MATERIALS

- A. For replacement of items removed, use materials complying with pertinent Sections of these Specifications and as approved by the Architect.

2.2 PAYMENT FOR COSTS

- A. The Owner will reimburse the Contractor for cutting and patching performed pursuant to the written Change Order, after the Contractor submits claim for such reimbursement. Perform other cutting and patching needed to comply with the Contract Documents at no additional cost to the Owner.

PART 3 - EXECUTION

3.1 SURFACE CONDITIONS

- A. Inspection:
1. Inspect existing conditions, including elements subject to movement or damage during cutting, excavating, patching, and backfilling.
 2. After uncovering the work, inspect conditions affecting installation of new work.
- B. Discrepancies:
1. If uncovered conditions are not as anticipated, immediately notify the Architect and secure needed directions.
 2. Do not proceed until unsatisfactory conditions are corrected.

3.2 PREPARATION PRIOR TO CUTTING

- A. Provide required protection including, but not necessarily limited to, shoring, bracing, and support to maintain structural integrity of the Work.

3.3 PERFORMANCE

- A. Perform required cutting and patching as required under pertinent other Sections of these Specifications.
 - 1. Perform cutting and demolition by methods, which will prevent damage to other portions of the Work and provide proper surfaces to receive installation of repair and new work.
 - 2. Perform fitting and adjusting of products to provide finished installation complying with the specified tolerances and finishes.

END OF SECTION

SECTION 011520

APPLICATIONS FOR PAYMENT

PART 1 - GENERAL

1.1 DESCRIPTION

- A. Work included: Comply with procedures described in this Section when applying for progress payment and final payment under the Contract.
- B. Related work:
 - 1. Documents affecting work of this Section include, but are not necessarily limited to, General Conditions, Supplementary Conditions, and Sections in Division I of these Specifications.
 - 2. The Contract Sum and the schedule for payments are described in the Form of Agreement.
 - 3. Payments upon Substantial Completion and Completion of the Work are described in the General Conditions and in Section 01700 of these Specifications.

1.2 SUBMITTALS

- A. Formal submittal: No later than the 25th day of the month for which the request for payment applies and unless otherwise directed by the Owner:
 - 1. Make a formal submittal of request for payment by filling in the agreed data, by typewriter or neat lettering in ink, on AIA Document G702, "Application and Certificate for Payment", plus continuation sheet or sheets.
 - 2. Sign and notarize the Application and Certificate for Payment.
 - 3. Submit the original and one copy of the Application and Certificate for Payment, including the continuation sheet or sheets to the Architect.
 - 4. The Architect will compare the formal submittal with prior approved submittals and, when approved, will sign the Application and Certificate for Payment and will distribute:
 - a. One original to Owner.

END OF SECTION

APPLICATIONS FOR PAYMENT

011520-1

PRECONSTRUCTION CONFERENCE

SECTION 012010

PART 1 - GENERAL

1.1 DESCRIPTION

- A. Work included: To help clarify construction contract administration procedures, the Owner will conduct a Preconstruction Conference prior to start of the Work. Provide attendance by the designated personnel.
- B. Related work:
 - 1. Documents affecting the work of this Section include, but are not necessarily limited to, General Conditions, Supplementary Conditions, and Sections in Division 1 of these Specifications.

1.2 QUALITY ASSURANCE

- A. For those persons designated by the Contractor, his subcontractors, and suppliers to attend the Preconstruction Conference, provide required authority to commit the entities they represent to solutions agreed upon in the Conference.

1.3 SUBMITTALS

- A. To the maximum extent practicable, advise the Owner at least 24 hours in advance of the Conference as to items to be added to the agenda.
- B. The Owner will compile minutes of the Conference, and will furnish copies of the minutes to the Contractor. The Contractor may make and distribute such other copies as he wishes.

1.4 PRECONSTRUCTION CONFERENCE

- A. The Conference will be scheduled to be held approximately 15 working days after the Owner has issued the Notice to Proceed, but prior to actual start of the Work.
- B. Attendance:
 - 1. Provide attendance by authorized representatives of the Contractor and major subcontractors.
- C. Minimum agenda: Data will be distributed and discussed on:
 - 1. Organizational arrangement of Contractor's and subcontractor's forces and personnel, materials suppliers and the Architect;
 - 2. Channels and procedures for communication;
 - 3. Construction schedule, including sequence of critical work and coordination with Owner's occupancy schedule;
 - 4. Contract documents, including distribution of required copies of Drawings;

5. Processing of Shop Drawings and other data submitted to the Owner for review;
6. Processing of field decisions and Change orders;
7. Rules and regulations governing performance of the Work;
8. Procedures for safety and first aid, security, quality control, housekeeping and related matters.

END OF SECTION

SECTION 013400

SUBMITTALS AND SUBSTITUTIONS

PART 1 - GENERAL

1.1 DESCRIPTION

- A. Work included: Make submittals required by the Contract Documents, and revise and resubmit as necessary to establish compliance with the specified requirements.
- B. Related work:
 - 1. Documents affecting work of this Section include, but are not necessarily limited to, General Conditions, Supplementary Conditions, and Sections in Division 1 of these Specifications.
 - 2. Individual requirements for submittals also may be described in pertinent Sections of these Specifications.
- C. Work not included:
 - 1. The Architect will not review unrequired submittals.
 - 2. The Contractor may require his subcontractors to provide drawings, setting diagrams, and similar information to help coordinate the Work, but such data shall remain between the Contractor and his subcontractors and will not be reviewed by the Architect.

1.2 QUALITY ASSURANCE

- A. Coordination of submittals:
 - 1. Prior to each submittal, carefully review and coordinate all aspects of each item being submitted.
 - 2. Verify that each item and the submittal for it conform in all respects with the specified requirements.
 - 3. By affixing the Contractor's signature to each submittal, certify that this coordination has been performed.
- B. Substitutions:
 - 1. The Contract is based on the standards of quality established in the Contract Documents. Substitutions will be considered only when a side-by-side comparison is provided between specified product/system and proposed and the change is substantiated by the Contractor's submittal of required data within 15 calendar days after award of the Contract.

SUMITTALS AND SUBSTITUTIONS

013400-1

2. Do not substitute materials, equipment, or methods unless the Architect has specifically approved such substitution in writing for this Work.

C. "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 the materials, equipment, or methods will be approved as equal unless the item has been specifically so approved for this Work by the Architect.
2. The decision of the Architect shall be final.

1.3 SUBMITTALS

- A. Make submittals of Shop Drawings, Samples, substitution requests, and other items in accordance with the provisions of this Section.

PART 2 - PRODUCTS

2.1 SHOP DRAWINGS

- A. Scale and measurements: Make Shop Drawings accurately to a scale sufficiently large to show all pertinent aspects of the item and its method of connection to the Work.
 - B. Types of prints required:
 1. Submit Shop Drawings in the form of a minimum of four blackline prints of each sheet for typical submittals (three shall be returned) and six prints of each sheet for Mechanical, Electrical, Plumbing, and Structural engineering or Interior Design (finishes related) submittals (three shall be returned). If more copies are required by the Contractor he may submit additional copies with the submittal.
- Review comments of the Architect will be shown on the prints when they are returned to the Contractor. The Contractor may make and distribute such copies as are required for his purposes.

2.2 MANUFACTURERS' LITERATURE

- A. Where contents of submitted literature from manufacturers include data not pertinent to the submittal, clearly show which portions of the contents is being submitted for review.
- B. Submit the number of copies which are required to be returned, plus two copies which will be retained by the Architect.

2.3 SAMPLES

- A. Provide Sample or Samples identical to the precise article proposed to be

provided. Identify as described under "Identification of submittals" below.

B. Number of Samples required:

1. Unless otherwise specified, submit Samples in the quantity required to be returned, plus two to be retained by the Architect.
2. By pre-arrangement in specific cases, a single Sample may be submitted for review and, when approved, be installed in the Work at a location agreed upon by the Architect.

2.4 COLORS AND PATTERNS

- A. Unless the precise color and pattern is specifically called out in the Contract Documents, and whenever a choice of color or pattern is available in the specified products, submit complete color and pattern charts as supplied by the manufacturer of the product specified to the Architect for selection.

PART 3 - EXECUTION

3.1 IDENTIFICATION OF SUBMITTALS

- A. Consecutively number all submittals.
1. When material is resubmitted for any reason, transmit under a new letter of transmittal and with a new transmittal number.
 2. On resubmittals, cite the original submittal number for reference.
- B. Accompany each submittal with a letter of transmittal showing all information required for identification and checking.
- C. On at least the first page of each submittal, and elsewhere as required for positive identification, show the submittal number in which the item was included.
- D. Maintain an accurate submittal log for the duration of the Work, showing current status of all submittals at all times. Make the submittal log available to the Architect for his review upon request.

3.2 GROUPING OF SUBMITTALS

- A. Unless otherwise specified, make submittals in groups containing all associated items to assure that information is available for checking each item when it is received.
1. Partial submittals may be rejected as not complying with the provisions of the Contract.
 2. The Contractor may be held liable for delays so occasioned.

3.3 TIMING OF SUBMITTALS

- A. Make submittals far enough in advance of scheduled dates for installation to provide time required for reviews, for securing necessary approvals, for possible revisions and resubmittals, and for placing orders and securing delivery.
- B. In scheduling, allow at least ten working days for review by the Architect following his receipt of the submittal.

3.4 ARCHITECT'S REVIEW

- A. Review by the Architect does not relieve the Contractor from responsibility for errors that may exist in the submitted data.
- B. Revisions:
 - 1. Make revisions required by the Architect.
 - 2. If the Contractor considers any required revision to be a change, he shall so notify the Architect.
 - 3. Make only those revisions directed or approved by the Architect.

END OF SECTION

SECTION 013700
SCHEDULE OF VALUES

PART 1 - GENERAL

1.1 DESCRIPTION

- A. Work included: Provide a detailed breakdown of the agreed Contract Sum showing values allocated to each of the various parts of the Work, as specified herein and in other provisions of the Contract Documents.
- B. Related work:
 - 1. Documents affecting work of this Section include, but are not necessarily limited to, General Conditions, Supplementary Conditions, and Sections in Division I of these Specifications.
 - 2. Schedule of values is required to be compatible with the "continuation sheet" accompanying applications for payment, as described in Section 01152.

1.2 QUALITY ASSURANCE

- A. Use required means to assure arithmetical accuracy of the sums described.
- B. When so required by the Owner, provide copies of the subcontracts or other data acceptable to the Owner, substantiating the sums described.

1.3 SUBMITTALS

- A. Prior to first application for payment, submit a proposed schedule of values to the Owner.
 - 1. Meet with the Owner and determine additional data, if any required to be submitted.
 - 2. Secure the Owner's approval of the schedule of values prior to submitting first application for payment.

END OF SECTION

SECTION 014100

TESTING LABORATORY SERVICES

PART 1 - GENERAL

1.1 DESCRIPTION

A. Work included:

1. Cooperate with the Owner's approved testing agency and all others responsible for testing and inspecting the Work.
2. Provide such other testing and inspecting as are specified to be furnished by the Contractor in this Section and/or elsewhere in the Contract Documents.

B. Related work:

1. Documents affecting work of this Section include, but are not necessarily limited to, General Conditions, Supplementary Conditions, and Sections in Division I of these Specifications.
2. Requirements for testing may be described in various Sections of these Specifications.
3. Where no testing requirements are described, but the Owner decides that testing is required, the Owner may require such testing to be performed under current pertinent standards for testing. Payment for such testing will be made as described in this Section.

C. Work not included:

1. Selection of testing laboratory: The Owner will select a prequalified independent testing laboratory.
2. Payment for initial testing: The Owner will pay for all initial services of the testing laboratory as further described in Article 2.1 of this Section.

1.2 QUALITY ASSURANCE

- A. The testing laboratory will be qualified to the Owner's approval in accordance with ASTM E329.
- B. Testing, when required, will be in accordance with all pertinent codes and regulations, and with selected standards of the American Society for Testing and Materials.

1.3 PRODUCT HANDLING

- A. Comply with pertinent provisions of Section 01640.
- B. Promptly process and distribute required copies of test reports and related instructions to assure necessary retesting and replacement of materials with the least possible delay in progress of the Work.

TESTING LABORATORY SERVICES

014100-1

PART 2 - PRODUCTS

2.1 PAYMENT FOR TESTING

- A. Initial services:
 - 1. The Owner will pay for initial testing services requested by the Owner. Testing specifically called for in the Contract Documents shall be paid for by the Contractor and (- see also Contractor's responsibility for code compliance testing below.)
 - 2. When initial tests indicate non-compliance with the Contract Documents, the costs of initial tests associated with that non-compliance will be deducted by the Owner from the Contract Sum.
- B. Retesting: When initial tests indicate non-compliance with the Contract Documents, subsequent retesting occasioned by the non-compliance shall be performed by the same testing agency, and costs thereof will be deducted by the Owner from the Contract Sum.

2.2 CODE COMPLIANCE TESTING

- A. Inspections and tests required by codes or ordinances, or by a plan approval authority, and which are made by a legally constituted authority, shall be the responsibility of and shall be paid for by the Contractor, unless otherwise provided in the Contract Documents.

2.3 CONTRACTOR'S CONVENIENCE TESTING

- A. Inspecting and testing performed exclusively for the Contractor's convenience shall be the sole responsibility of the Contractor.

PART 3 - EXECUTION

3.1 COOPERATION WITH TESTING LABORATORY

- A. Representatives of the testing laboratory shall have access to the Work at all times and at all locations where the Work is in progress. Provide facilities for such access to enable the laboratory to perform its functions properly.

3.2 TAKING SPECIMENS

- A. All specimens and samples for testing, unless otherwise provided in the Contract Documents, shall be taken by the testing personnel. The testing laboratory will provide all sampling equipment and personnel. The testing laboratory will perform all deliveries of specimens and samples to the testing laboratory.

3.3 SCHEDULES FOR TESTING

- A. Establishing schedule:
 - 1. By advance discussion with the testing laboratory selected by the Owner, determine the time required for the laboratory to perform its tests and to

issue each of its findings.

2. Provide all required time within the construction schedule.
- B. Revising schedule: When changes of construction schedule are necessary during construction, coordinate all such changes with the testing laboratory as required.
 - C. Adherence to schedule: When the testing laboratory is ready to test according to the established schedule, but is prevented from testing or taking specimens due to incompleteness of the Work, all extra charges for testing attributable to the delay may be back-charged to the Contractor and shall not be borne by the Owner.

END OF SECTION

SECTION 015000

TEMPORARY FACILITIES AND CONTROLS

PART 1 - GENERAL

1.1 DESCRIPTION

- A. Work included: Provide temporary facilities and controls needed for the Work including, but not necessarily limited to:
 - 1. Temporary utilities such as water, electricity, and telephone;
 - 2. Sanitary facilities;
 - 3. Enclosures such as tarpaulins, barricade, and canopies;
- B. Related work:
 - 1. Documents affecting work of this Section include, but are not necessarily limited to, General Conditions, Supplementary Conditions, and Sections in Division 1 of these Specifications.
 - 2. Except that equipment furnished by subcontractors shall comply with requirements of pertinent safety regulations, such equipment normally furnished by the individual trades in execution of their own portions of the Work is not part of this Section.
 - 3. Permanent installation and hookup of the various utility lines are described in other Sections.

1.2 PRODUCT HANDLING

- A. Maintain temporary facilities and controls in proper and safe condition throughout progress of the Work.

PART 2 - PRODUCTS

2.1 UTILITIES

- A. Water:
 - 1. Provide necessary temporary piping and water supply and, upon completion of the Work, remove such temporary facilities.
- B. Electricity:
 - 1. Provide necessary temporary wiring and, upon completion of the Work, remove such temporary facility.
 - 2. Provide area distribution boxes so located that the individual trades may furnish and use 100 ft maximum length extension cords to obtain power and lighting at points where needed for work, inspection, and safety.
 - 3. Owner's power supply may be tapped for temporary power box only after coordination with Owner's representative.

TEMPORARY FACILITIES AND CONTROLS

015000-1

2.2 FACILITIES

A. Sanitary facilities:

1. Provide temporary sanitary facilities in the quantity required for use by all personnel. No Owner's facilities shall be used by construction personnel.
2. Maintain in a sanitary condition at all times.
3. Coordinate the location of facilities with the Owner.

2.3 ENCLOSURES

- A. Provide and maintain for the duration of construction all scaffolds, tarpaulins, canopies, warning signs, steps, platforms, bridges, and other temporary construction necessary for proper completion of the Work in compliance with pertinent safety and other regulations.
- B. Provide barricades at walk and parking areas to allow for access to the building and separate the public from ongoing work.

PART 3 - EXECUTION

3.1 MAINTENANCE AND REMOVAL

- A. Maintain temporary facilities and controls as long as needed for safe and proper completion of the Work.
- B. Remove such temporary facilities and controls as rapidly as progress of the Work will permit, or as directed by the Owner.

END OF SECTION

SECTION 016400

PRODUCT HANDLING

PART 1 - GENERAL

1.1 DESCRIPTION

- A. Work included: Protect products scheduled for use in the Work by means including, but not necessarily limited to, those described in this Section.
- B. Related work:
 - 1. Documents affecting work of this Section include, but are not necessarily limited to, General Conditions, Supplementary Conditions, and Sections in Division 1 of these Specifications.
 - 2. Additional procedures also may be prescribed in other Sections of these Specifications.

1.2 QUALITY ASSURANCE

- A. Include within the Contractor's quality assurance program such procedures as are required to assure full protection of work and materials.

1.3 MANUFACTURERS' RECOMMENDATIONS

- A. Except as otherwise approved by the Architect, determine and comply with manufacturers' recommendations on product handling, storage, and protection.

1.4 PACKAGING

- A. Deliver products to the job site in their manufacturer's original container, with labels intact and legible.
 - 1. Maintain packaged materials with seals unbroken and labels intact until time of use.
 - 2. Promptly remove damaged material and unsuitable items from the job site, and promptly replace with material meeting the specified requirements, at no additional cost to the Owner.
- B. The Architect may reject as non-complying such material and products that do not bear identification satisfactory to the Architect as to manufacturer, grade, quality, and other pertinent information.

1.5 PROTECTION

- A. Protect finished surfaces, including jambs and soffits of openings used as passageways, through which equipment and materials are handled.
- B. Provide protection for finished floor surfaces in traffic areas prior to allowing equipment or materials to be moved over such surfaces.

PRODUCT HANDLING

016400-1

- C. Maintain finished surfaces clean, unmarred, and suitably protected until accepted by the Owner.

1.6 REPAIRS AND REPLACEMENTS

- A. In event of damage, promptly make replacements and repairs to the approval of the Architect and at no additional cost to the Owner.
- B. Additional time required to secure replacements and to make repairs will not be considered by the Architect to justify an extension in the Contract Time of Completion.

END OF SECTION

SECTION 017000
CONTRACT CLOSEOUT

PART 1 - GENERAL

1.1 DESCRIPTION

- A. Work included: Provide an orderly and efficient transfer of the completed Work to the Owner.
- B. Related work:
 - 1. Documents affecting work of this Section include, but are not necessarily limited to, General Conditions, Supplementary Conditions, and Sections in Division I of these Specifications.
 - 2. Activities relative to Contract closeout are described in of the General Conditions.

1.2 QUALITY ASSURANCE

- A. Prior to requesting inspection by the Architect, use adequate means to assure that the Work is completed in accordance with the specified requirements and is ready for the requested inspection.

1.3 PROCEDURES

- A. Substantial Completion:
 - 1. Make a written request for Substantial Completion Inspection including any items required by the Contract Documents that are to be completed.
 - 2. Within a reasonable time after receipt of the request, the Architect will inspect to determine status of completion.
 - 3. Should the Architect determine that the Work is not substantially complete:
 - a. The Architect promptly will so notify the Contractor, in writing, giving the reasons therefore.
 - b. Remedy the deficiencies and notify the Architect when ready for reinspection.
 - c. The Architect will reinspect the Work.
 - 4. When the Architect concurs that the Work is substantially complete:
 - a. The Architect will prepare a "Certificate of Substantial Completion" on AIA form G704, accompanied by the Contractor's list of items to be completed or corrected, as verified by the Architect.
 - b. The Architect will submit the Certificate to the Owner and to the Contractor for their written acceptance of the responsibilities assigned to them in the Certificate.
- B. Final Completion:
 - 1. Make a written request for Final Completion Inspection, certifying the following;

- a. Contract Documents have been reviewed;
 - b. Work has been inspected for compliance with the Contract Documents;
 - c. Work has been completed in accordance with the Contract Documents;
 - d. Equipment and systems have been tested as required, and are operational;
 - e. Work is completed and ready for final inspection.
 - 2. The Architect will make an inspection to verify status of completion.
 - 3. Should the Architect determine that the Work is incomplete or defective:
 - a. The Architect promptly will so notify the Contractor, in writing, listing the incomplete or defective work.
 - b. Remedy the deficiencies promptly, and notify the Architect when ready for reinspection.
 - 6. When the Architect determines that the Work is acceptable under the Contract Documents, he will request the Contractor to make closeout submittals.
- C. Closeout submittals include, but are not necessarily limited to:
- 1. Warranties and bonds;
 - 2. Spare parts and materials extra stock;
 - 3. Keys and incidental hardware;
 - 4. Evidence of compliance with requirements of governmental agencies having jurisdiction including, but not necessarily limited to:
 - a. Certificates of Inspection;
 - b. Certificates of Occupancy;
 - 5. Certificates of Insurance for products and completed operations;
 - 6. Evidence of payment and release of liens from each subcontractor and material supplier associated with the Work;
 - 7. List of subcontractors, service organizations, and principal vendors, including names, addresses, and telephone numbers where they can be reached for emergency service at all times including nights, weekends, and holidays.
 - 8. As-built Drawings.

1.4 INSTRUCTION

- A. Instruct the Owner's personnel in proper operation and maintenance of systems, equipment, and similar items that were provided as part of the Work.

END OF SECTION

**CONTRACT CLOSEOUT
01700-2**

SECTION 017100

CLEANING

PART 1 - GENERAL

1.1 DESCRIPTION

- A. Work included: Throughout the construction period, maintain the building and site in a standard of cleanliness as described in this Section.
- B. Related work:
 - 1. Documents affecting work of this Section include, but are not necessarily limited to, General Conditions, Supplementary Conditions, and Sections in Division I of these Specifications.
 - 2. In addition to standards described in this Section, comply with requirements for cleaning as described in pertinent other Sections of these Specifications.

1.2 QUALITY ASSURANCE

- A. Conduct daily inspection, and more often if necessary, to verify that requirements for cleanliness are being met.
- B. In addition to the standards described in this Section, comply with pertinent requirements of governmental agencies having jurisdiction.

2.1 CLEANING MATERIALS AND EQUIPMENT

- A. Provide required personnel, equipment, and materials needed to maintain the specified standard of cleanliness.

2.2 COMPATIBILITY

- A. Use only the cleaning materials and equipment which are compatible with the surface being cleaned, as recommended by the manufacturer of the material.

PART 3 - EXECUTION

3.1 PROGRESS CLEANING

- A. General:
 - 1. Retain stored items in an orderly arrangement allowing maximum access, not impeding traffic or drainage, and providing required protection of materials.
 - 2. Do not allow accumulation of scrap, debris, waste material, and other items not required for construction of this Work.
 - 3. At least twice each week and more often if necessary, completely remove all scrap, debris, and waste material from the job site.
 - 4. Provide adequate storage for all items awaiting removal from the job site, observing requirements for fire protection and protection of the ecology.

B. Site:

1. Daily and more often if necessary, inspect the site and pick up all scrap, debris, and waste material. Remove such items to the place designated for their storage.
2. Weekly and more often if necessary, inspect all arrangements of materials stored on the site. Restack, tidy, or otherwise service arrangements to meet the requirements of subparagraph 3.1-A-1 above.
3. Maintain the site in a neat and orderly condition at all times.

C. Structures:

1. Weekly and more often if necessary, inspect the structures and pick up all scrap, debris, and waste material. Remove such items to the place designated for their storage.
2. As required preparatory to installation of succeeding materials, clean the structures or pertinent portions thereof to the degree of cleanliness recommended by the manufacturer of the succeeding material, using equipment and materials required to achieve the necessary cleanliness.
 - a. "Clean," for the purpose of this subparagraph, shall be interpreted as meaning free from foreign material, which, in the opinion of the Architect, may be injurious to finish materials.

3.2 FINAL CLEANING

A. "Clean," for the purpose of this Article, and except as may be specifically provided otherwise, shall be interpreted as meaning the level of cleanliness generally provided by skilled cleaners using commercial quality building maintenance equipment and materials.

B. Prior to completion of the Work, remove from the job site all tools, surplus materials, equipment, scrap, debris, and waste. Conduct final progress cleaning as described in Article 3.1 above.

C. Site:

1. Unless otherwise specifically directed by the Architect, broom clean paved areas on the site and public paved areas adjacent to the site.
2. Completely remove resultant debris.

D. Structures:

1. Exterior:
 - a. Visually inspect exterior surfaces and remove all traces of soil, waste materials, smudges, and other foreign matter.
 - b. Remove all traces of splashed materials from adjacent surfaces.

- 2. Interior:
 - a. Visually inspect interior surfaces and remove all traces of soil, waste materials, smudges and other foreign matter.
 - b. When cleaning surfaces of finished materials and assemblies, use only those cleaners recommended for that purpose by the manufacturer.
- E. Schedule final cleaning as approved by the Architect to enable the Owner to accept a completely clean Work.

3.3 CLEANING DURING OWNER'S OCCUPANCY

- A. Responsibilities for interim and final cleaning shall be as determined by the Architect in accordance with the General Conditions of the Contract.

END OF SECTION

SECTION 017200

PROJECT RECORD DOCUMENTS

PART 1 - GENERAL

1.1 DESCRIPTION

- A. Work included:
 - 1. Throughout progress of the Work, maintain an accurate record of changes in the Contract Documents, as described in Article 3.1 below.
 - 2. Upon completion of the Work, transfer the recorded changes to a set of Record Documents, as described in Article 3.2 below.
- B. Related work:
 - 1. Documents affecting work of this Section include, but are not necessarily limited to, General Conditions, Supplementary Conditions, and Sections in Division I of these Specifications.
 - 2. Other requirements affecting Project Record Documents may appear in pertinent other Sections of these Specifications.

1.2 QUALITY ASSURANCE

- A. Delegate the responsibility for maintenance of Record Documents to one person on the Contractor's staff as approved by the Architect.
- B. Accuracy of records:
 - 1. Thoroughly coordinate changes within the Record Documents, making adequate and proper entries on each page of Specifications and each sheet of Drawings and other Documents where such entry is required to show the change properly.
 - 2. Accuracy of records shall be such that future search for items shown in the Contract Documents may rely reasonably on information obtained from the approved Project Record Documents.
- C. Make entries within 24 hours after receipt of information that the change has occurred.

1.3 SUBMITTALS

- A. Comply with pertinent provisions of Section 01340.
- B. The Architect's approval of the current status of Project Record Documents may be a prerequisite to the Architect's approval of requests for progress payment and request for final payment under the Contract.
- C. Prior to submitting each request for progress payment, secure the Architect's approval of the current status of the Project Record Documents.
- D. **Prior to submitting request for final payment, submit the final Project Record Documents to the Architect and secure his approval.**

PROJECT RECORD DOCUMENTS

017200-1

1.4 PRODUCT HANDLING

- A. Maintain the job set of Record Documents completely protected from deterioration and from loss and damage until completion of the Work and transfer of all recorded data to the final Project Record Documents.
- B. In the event of loss of recorded data, use means necessary to again secure the data to the Architect's approval.
 - 1. Such means shall include, if necessary in the opinion of the Architect, removal and replacement of concealing materials.
 - 2. In such case, provide replacements to the standards originally required by the Contract Documents.

PART 2 - PRODUCTS

2.1 RECORD DOCUMENTS

- A. Job set: Promptly following receipt of the Owner's Notice to Proceed, secure from the Architect at no charge to the Contractor one complete set of all Documents comprising the Contract.
- B. Final Record Documents: At a time nearing the completion of the Work, secure from the Architect at no charge to the Contractor one complete set of reproducible copies of all Drawings in the Contract.

PART 3 - EXECUTION

3.1 MAINTENANCE OF JOB SET

- A. Immediately upon receipt of the job set described in Paragraph 2.1-A above, identify each of the Documents with the title, "RECORD DOCUMENTS - JOB SET."
- B. Preservation:
 - 1. Considering the Contract completion time, the probable number of occasions upon which the job set must be taken out for new entries and for examination, and the conditions under which these activities will be performed, devise a suitable method for protecting the job set to the approval of the Architect.
 - 2. Do not use the job set for any purpose except entry of new data and for review by the Architect, until start of transfer of data to final Project Record Documents.
 - 3. Maintain the job set at the site of Work as the Architect designates that site.
- C. Making entries on Drawings:
 - 1. Using an erasable colored pencil (not ink or indelible pencil), clearly describe the change by graphic line and note as required.
 - 2. Date all entries.
 - 3. Call attention to the entry by a "cloud" drawn around the area or areas affected.
 - 4. In the event of overlapping changes, use different colors for the overlapping changes.

- D. Make entries in the pertinent other Documents as approved by the Architect.
- E. Conversion of schematic layouts:
 - 1. In some cases on the Drawings, arrangements of conduits, circuits, piping, ducts, and similar items, is shown schematically and is not intended to portray precise physical layout.
 - a. The Contractor, subject to the Architect's approval determines final physical arrangement.
 - b. However, design of future modifications of the facility may require accurate information as to the final physical layout of items, which are shown only schematically on the Drawings.
 - 2. Show on the job set of Record Drawings, by dimension accurate to within one inch, the centerline of each run of items such as are described in subparagraph 3.1-E-1 above.
 - a. Clearly identify the item by accurate note such as "cast iron drain," "galv. water," and the like.
 - b. Show, by symbol or note, the vertical location of the item ("under slab," "in ceiling plenum," "exposed," and the like).
 - c. Make all identification sufficiently descriptive that it may be related reliably to the Specifications.
 - 3. The Architect may waive the requirements for conversion of schematic layouts where, in the Architect's judgment, conversion serves no useful purpose. However, do not rely upon waivers being issued except as specifically issued in writing by the Architect.

3.2 FINAL PROJECT RECORD DOCUMENTS

- A. The purpose of the final Project Record Documents is to provide factual information regarding all aspects of the Work, both concealed and visible, to enable future modification of the Work to proceed without lengthy and expensive site measurement, investigation, and examination.
- B. Approval of recorded data prior to transfer:
 - 1. Following receipt of the transparencies described in Paragraph 2.1-B above, and prior to start of transfer of recorded data thereto, secure the Architect's approval of all recorded data.
 - 2. Make required revisions.
- C. Transfer of data to Drawings:
 - 1. Carefully transfer change data shown on the job set of Record Drawings to the corresponding transparencies, coordinating the changes as required.

2. Clearly indicate at each affected detail and other Drawing a full description of changes made during construction, and the actual location of items described in subparagraph 3.1-E-1 above.
3. Call attention to each entry by drawing a "cloud" around the area or areas affected.
4. Make changes neatly, consistently, and with the proper media to assure longevity and clear reproduction.

D. Transfer of data to other Documents:

1. If the Documents other than Drawings have been kept clean during progress of the Work, and if entries thereon have been orderly to the approval of the Architect, the job set of those Documents other than Drawings will be accepted as final Record Documents.
2. If any such Document is not so approved by the Architect, secure a new copy of that Document from the Architect at the Architect's usual charge for reproduction and handling, and carefully transfer the change data to the new copy to the approval of the Architect.

E. Review and submittal:

1. Submit the completed set of Project Record Documents to the Architect as described in Paragraph 1.3-D above.
2. Participate in review meetings as required.
3. Make required changes and promptly deliver the final Project Record Documents to the Architect.

3.3 CHANGES SUBSEQUENT TO ACCEPTANCE

- A. The Contractor has no responsibility for recording changes in the Work subsequent to Final Completion, except for changes resulting from work performed under Warranty.

END OF SECTION

SECTION 017300

OPERATION AND MAINTENANCE DATA

PART 1 - GENERAL

1.1 DESCRIPTION

- A. Work included: To aid the continued instruction of operating and maintenance personnel, and to provide a positive source of information regarding the products incorporated into the Work, furnish and deliver the data described in this Section and in pertinent other Sections of these Specifications.
- B. Related work:
 - 1. Documents affecting work of this Section include, but are not necessarily limited to, General Conditions, Supplementary Conditions, and Sections in Division I of these Specifications.
 - 2. Required contents of submittals also may be amplified in pertinent other Sections of these Specifications.

1.2 QUALITY ASSURANCE

- A. In preparing data required by this Section, use only personnel who are thoroughly trained and experienced in operation and maintenance of the described items, completely familiar with the requirements of this Section, and skilled in technical writing to the extent needed for communicating the essential data.

1.3 SUBMITTALS

- A. Comply with pertinent provisions of Section 01340.
- B. Unless otherwise directed in other Sections or in writing by the Architect, submit three copies of the final Manual to the Architect prior to indoctrination of operation and maintenance personnel.

PART 2 - PRODUCTS

2.1 INSTRUCTION MANUALS

- A. Where instruction Manuals are required to be submitted under other Sections of these Specifications, prepare in accordance with the provisions of this Section.
- B. Format:
 - 1. Size: 8-1/2" x 11"
 - 2. Paper: White bond, at least 20 lb weight
 - 3. Text: Neatly written or printed
 - 4. Drawings: 11" in height preferable; bind in with text; foldout acceptable; larger drawings acceptable but fold to fit within the Manual and provide a drawing pocket inside rear cover or bind in with text.

OPERATION AND MAINTENANCE DATA

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5. Flysheets: Separate each portion of the Manual with neatly prepared flysheets briefly describing contents of the ensuing portion; flysheets may be in color.
 6. Binding: Use heavy-duty plastic or fiberboard covers with binding mechanism concealed inside the Manual; 3-ring binders will be acceptable; all binding is subject to the Architect's approval.
 7. Measurements: Provide all measurements in U. S. standard units such as feet-and inches, lbs, and cfm; where items may be expected to be measured within ten years in accordance with metric formulae, provide additional measurements in the "International System of Units " (SI).
- C. Provide front and back covers for each Manual, using durable material approved by the Architect, and clearly identified on or through the cover with at least the following information:

OPERATING AND MAINTENANCE INSTRUCTIONS

(_____)
 (name and address of Work)
 (_____)
 (name of Contractor)
 (_____)
 (general subject of this Manual)
 (_____)
 (space for approval signature of)
the Architect and approval date

- D. Contents: Include at least the following:
1. Neatly typewritten index near the front of the Manual, giving immediate information as to location within the Manual of all emergency information regarding the installation.
 2. Complete instructions regarding operation and maintenance of all equipment involved including lubrication, disassembly, and reassembly.
 3. Complete nomenclature of all parts of all equipment.
 4. Complete nomenclature and part number of all replaceable parts, name and address of nearest vendor, and all other data pertinent to procurement procedures.
 5. Copy of all guarantees and warranties issued.
 6. Manufacturers' bulletins, cuts, and descriptive data, where pertinent, clearly indicating the precise items included in this installation and deleting, or otherwise clearly indicating, all manufacturers' data with which this installation is not concerned.
 7. Such other data as required in pertinent Sections of these Specifications.

PART 3 - EXECUTION

3.1 INSTRUCTION MANUALS

- A. Final: Complete the Manuals in strict accordance with the format shown in these specifications.

B. Revisions:

1. Following the indoctrination and instruction of operation and maintenance personnel, review any proposed revisions of the Manual with the Architect.
2. If the Contractor is required by the Architect to revise previously approved Manuals, compensation will be made as provided for under "Changes" in the General Conditions.

END OF SECTION

SECTION 017400

WARRANTIES

PART 1 - GENERAL

1.1 STANDARD & SPECIAL PRODUCT WARRANTIES

- A. Work Included: Standard product warranties, preprinted written warranties published by individual manufacturers for particular products and are specifically endorsed by the manufacturer to the Owner. Special warranties, written warranties required by or incorporated in Contract Documents, to extend time limits provided by standard warranties or to provide greater rights for the Owner. Note: All Standard Product Warranties and Special warranties are to be provided.

1.2 DISCLAIMERS AND LIMITATIONS

- A. Manufacturer's disclaimers and limitations on product warranties do not relieve the Contractor of the warranty on the Work that incorporates the products, nor does it relieve suppliers, manufacturers, and Subcontractors required to countersign special warranties with the Contractor.

1.3 RELATED DAMAGES AND LOSSES

- A. When correcting warranted Work that has failed, remove and replace other Work that has been damaged as a result of such failure or that must be removed and replaced to provide access for correction of warranted Work.

1.4 REINSTATEMENT OF WARRANTY

- A. When Work covered by a warranty has failed and been corrected, reinstate the warranty by written endorsement. The reinstated warranty shall be equal to the original warranty with an equitable adjustment for depreciation.

1.5 REPLACEMENT COST

- A. On determination that Work covered by a warranty has failed, replace or rebuild the Work to an acceptable condition complying with requirements of Contract Documents. The Contractor is responsible for the cost of replacing or rebuilding defective Work regardless of whether the Owner has benefited from use of the Work through part of its useful service life.

1.6 OWNER'S RECOURSE

- A. Written warranties made to the Owner are in addition to implied warranties, and shall not limit duties, obligations, rights and remedies otherwise available under the law, nor shall warranty periods be interpreted as limitations on time in which the Owner can enforce such other duties, obligations, rights, or remedies.

WARRANTIES

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B. Rejection of Warranties:

1. The Owner reserves the right to reject warranties and limit selections to products with warranties not in conflict with requirements of the Contract Documents. The Owner reserves the right to refuse to accept Work where a special warranty, or similar commitment is required, until evidence is presented that entities required to countersign commitments are willing to do so.

1.7 SUBMIT WRITTEN WARRANTIES

- A. Submit written warranties to the Architect prior to the date certified for Substantial Completion. If the Architect's Certificate of Substantial Completion designates a commencement date for warranties other than the date of Substantial Completion, submit written warranties on the Architect's request.
- B. When a designated portion of the Work is completed and occupied or used, by separate agreement with the Contractor during the construction period, submit properly executed warranties to the Architect within fifteen days of completion of that designated portion of the Work.
- C. When a special warranty is to be executed by the Contractor, or the Contractor and a subcontractor, supplier or manufacturer, prepare a written document that contains appropriate terms and identification, ready for execution by the required parties. Submit a draft to the Owner through the Architect for approval prior to final execution.
- D. Refer to individual Sections of Divisions -2 through -16 for specific content, and particular requirements for submittal of special warranties.
- E. Bind warranties and bonds in heavy-duty, commercial quality, durable 3-ring vinyl covered loose-leaf binders, thickness as necessary to accommodate contents, and sized to receive 8-1/2" by 11" paper.
- F. Provide heavy paper dividers with celluloid covered tabs for each warranty. Mark the tab to identify the product or installation. Provide a typed description of the product or installation, including the name of the product, and the name, address and telephone number of the installer.
- G. Identify each binder on the front of the spine with the typed or printed title "WARRANTIES", the Project title or name, and the name of the Contractor.
- H. When operating and maintenance manuals are required for warranted construction, provide additional copies of each warranty, as necessary, for inclusion in each required manual.

END OF SECTION

**DIVISION 2
SITE WORK**

SECTION 022810

TERMITE CONTROL

PART 1 - GENERAL

1.1 DESCRIPTION

- A. Work included: Provide soil poisoning to control subterranean termites as specified herein and needed for a complete and proper treatment.
- B. Related work:
 - 1. Documents affecting work of this Section include, but are not necessarily limited to, General Conditions, Supplementary Conditions, and Sections in Division I of these Specifications.

1.2 QUALITY ASSURANCE

- A. Use adequate numbers of skilled workmen who are thoroughly trained and experienced in the necessary crafts and who are completely familiar with the specified requirements and the methods needed for proper performance of the work of this Section.
- B. Qualifications of subcontractor:
 - 1. Properly licensed to provide such services by governmental agencies having jurisdiction.
 - 2. Not less than five years successful experience in soil treatment for subterranean termites.

1.3 SUBMITTALS

- A. Comply with pertinent provisions of Section 013400.
- B. Product data: Within 15 calendar days after the Contractor has received the Owner's Notice to Proceed, submit:
 - 1. Materials list of items proposed to be provided under this Section;
 - 2. Manufacturer's specifications and other data needed to prove compliance with the specified requirements;
 - 3. Manufacturer's recommended installation procedures which, when approved by the Architect, will become the basis for accepting or rejecting actual installation procedures used on the Work.

1.4 WARRANTY

- A. Upon completion of the Work, and as a condition of its acceptance, deliver to the Architect two copies of a Warranty signed by an authorized representative of the installing subcontractor, and co-signed by the Contractor for a one year warranty, agreeing:

TERMITE CONTROL

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1. To make inspections if requested by the owner in the first year and an inspection of the Work at one year following Date of Substantial Completion for the purpose of detecting termite infestation;
2. If termite infestation is found during that period, to retreat in accordance with prevailing practices of the trade and within ten calendar days after such infestation is discovered;
3. To repair damage to the Work caused by subterranean termites during the warranty period;
4. To make such inspections, retreatment, and repairs at no additional cost to the Owner.

PART 2 - PRODUCTS

2.1 MATERIALS

- A. Chemicals or chemical combinations approved for use by Federal and State governmental agencies.
- B. If combinations of toxicants are approved by governmental agencies having jurisdiction, provide toxicants having such approval and in the maximum strength so approved, at no additional cost to the Owner.

PART 3 - EXECUTION

3.1 SURFACE CONDITIONS

- A. Examine the areas and conditions under which work of this Section will be performed. Correct conditions detrimental to timely and proper completion of the Work. Do not proceed until unsatisfactory conditions are corrected.

3.2 APPLICATION

- A. Begin soil poisoning only after all preparation for slab placement is complete.
- B. Slabs on grade:
 1. Apply toxicant as an overall treatment at the minimum rate recommended by the manufacturer under slabs on grade within building lines.
- C. Utility entrances:
 1. Apply toxicant at the rate recommended by the manufacturer at critical locations such as where utilities pass through exterior walls and through floor slabs.
 2. Extend treatment not less than 48" from wall into trench.
- D. Walls:
 1. Apply toxicant at the rate recommended by the manufacturer along both sides of all foundations walls, cross walls, and grade beams, after all nearby excavation has been completed.
 2. Apply toxicant at the rate recommended by the manufacturer to voids in masonry

walls.

- E. Miscellaneous: Apply toxicant at the rate recommended by the manufacturer at the following areas:
 - 1. Immediately below expansion joints, control joints, and all areas where slab will be penetrated by construction features.
 - 2. Where exterior facings or veneers extend below grade level along the exterior side of all foundation walls.
- F. If soil is disturbed after treatment, retreat disturbed areas.

END OF SECTION

SECTION 023000

SUBSURFACE CONDITIONS

PART 1 - GENERAL

1.1 DESCRIPTION

- A. General: A soils investigation for the site of this project has been performed and the findings have been prepared by Magnum Engineering, Inc. 429 Florida Avenue Lynn Haven, Florida 32444 (850-258-0994).
- B. Availability: A copy of the findings is included in this section of the specifications.
- C. Use of Data:
 - 1. Bidders shall acquaint themselves with the soils investigations, particularly pertaining to the types of soil conditions found at this site.
 - 2. The report is included herein for information, and is available for bidder's information, but is not a warranty of subsurface conditions.
- D. Excavation Note: If conditions are found that appear or are other than that identified in the report, contact the Architect immediately, so the Owner's geotechnical consultant can be on site to observe conditions and determine if more excavation may be required.

END OF SECTION



MAGNUM ENGINEERING INC
GEOTECHNICAL ENGINEERING CONSULTANTS

GEOTECHNICAL ENGINEERING REPORT

MIDWAY TRAINING FACILITY
GADSDEN COUNTY, FLORIDA

PREPARED FOR:

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Joel Sampson Architect, Inc.
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Quincy, Florida 32351**

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MAGNUM ENGINEERING INC
GEOTECHNICAL ENGINEERING CONSULTANTS

November 30, 2023

Mr. Joel Sampson
Joel Sampson Architect, Inc.
212 N. Adams Street
Quincy, Florida 32351

SUBJECT: Midway Training Facility – Geotechnical Services
Gadsden County, Florida
Project Number: M122-120-778

Dear Mr. Sampson:

This letter forwards the results of our Geotechnical exploration for the subject development in Midway, Florida. Our exploration consisted of Six (6) 30-foot deep Standard Penetration (SPT) borings in the proposed building footprints. The subsurface exploration was conducted to provide information needed in the design of an effective foundation system for the referenced development.

The following report presents the results of our study as well as our evaluation and recommendations pertaining to the geotechnical aspects of the project. Upon completion of our field testing, the samples were brought back to the office for visual inspection, classification, and analysis by our engineering staff.

Project Information

The subject site is located southwest of Memorial Blue Star Highway (U.S. Highway 90) and north of Interstate I-10 in Gadsden County, Florida. At the time of our exploration, the site was undeveloped and had recently been cleared. #57 gravel was located at the surface on portions of the site.

We understand that the proposed structures will be supported on conventionally designed shallow foundations and will be single-story structures with CMU walls. Floor plan areas will be 9,920 square feet for the training facility and 5,065 square feet for the office facility. No Structural or grading information was available at the writing of this report. For engineering purposes, we have assumed maximum wall loads to be less than 3 kips per linear feet and maximum column loads will be less than 20 kips. Additionally, we have estimated less than 3 feet of cut/fill to achieve the finished floor elevation.

If any of the above information is incorrect, please inform Magnum Engineering, Inc. so that we can review and update our recommendations, as needed.

Subsurface Conditions

Figure #1 shows the Boring Location Plan and Figure #2 shows the Logs of Borings for Standard Penetration Test borings B-1 through B-6. The test locations were established in the field using the provided site plan with LAT/LONG coordinates of building corners, and estimating right angles with reference to existing site landmarks. Therefore, the boring locations should be considered approximate.

The Standard Penetration Test (SPT) borings were performed in accordance with ASTM D-1586. The borings were advanced using mud-rotary techniques. Split-Spoon samples were obtained using a 2-inch O.D. split spoon sampler every two feet in the top 10 feet of the borings and every 5 feet thereafter until the boring termination depth was reached.

Borings

The soil types encountered at the specific boring locations are presented in the form of Logs of Borings, and are attached as Figure 2. The stratifications presented is based on visual examination of the recovered soil samples and the interpretation of field logs by a geotechnical engineer. Included with the profiles are the N-values for the SPT borings. The N-values have been empirically correlated with various soil properties and are considered to be indicative of the relative density of cohesionless soils and the consistency of cohesive soils. Also included with the Logs of Boring are the groundwater levels measured at the time the borings were performed.

The building borings (B-1 through B-6) generally encountered medium dense slightly silty and silty fine sands from the existing ground surface to approximately 4 feet below existing grade underlain by medium dense clayey and silty fine sands to the boring termination depth of 30 feet below existing grade.

The above subsurface descriptions are of a generalized nature, provided to highlight the major soil strata encountered. The Logs of Boring should be reviewed for specific subsurface conditions at each boring location. The stratifications shown on the Logs of Boring represent the subsurface conditions at the actual boring locations only, and variations in the subsurface conditions can and may occur between boring locations and should therefore be expected. The stratifications represent the approximate boundary between subsurface materials, and the transitions between strata may be gradual.

Please refer to the attached logs of borings (Figure #2) for a more detailed description of the soils encountered in our borings.

Groundwater Conditions

Groundwater was encountered at roughly 27.0 feet below existing grade at the time of drilling (November 3, 2023), which was during a period of normal seasonal rainfall. Large fluctuations are possible under severe weather conditions. We recommend that the Contractor verify the actual groundwater levels at the time of construction to determine potential impacts groundwater will have on construction procedures.

CONCLUSIONS AND RECOMMENDATIONS

General

The following geotechnical related design recommendations have been developed on the basis of the previously described project characteristics and subsurface conditions encountered. If there are any changes in these project criteria, including project location on the site, a review should be made by Magnum Engineering to determine if modifications to the recommendations are warranted.

Once final design plans and specifications are available, a general review by Magnum Engineering is recommended as a means to check that the evaluations made in preparation of this report are correct and that earthwork and foundation recommendations are properly interpreted and implemented

Site/Soil Preparation Recommendations

Clearing and Grading

All topsoil and unsuitable materials should be removed to a distance of 5 feet beyond the perimeter of construction. Unsuitable materials include topsoil, concrete, any soft unstable material and miscellaneous (non-soil) fill. Removal of trees and shrubs should include removal of the root system down to finger-sized roots.

Care should be exercised during grading and fill placement operations. The combination of heavy construction equipment traffic and excess surface moisture can cause pumping and deterioration of the near surface soils. The severity of this potential problem depends to a great extent on the weather conditions prevailing during construction. The contractor should exercise discretion when selecting equipment sizes and also make a concerted effort to control surface water while the subgrade soils are exposed. If such problems do arise, the operations in the affected area should be halted and the geotechnical engineer contacted to evaluate the condition.

Engineered Fill

Engineered fill placed beneath floor slabs and footings should be compacted to at least 95 percent of the modified Proctor maximum dry density (ASTM D-1557). In addition, the top foot of the exposed in-place soils should also be compacted to a minimum of 95 percent of the modified Proctor maximum dry density (ASTM D1557). Engineered fill material should be free of significant organic matter or debris, should not contain clay and have a uniform composition. Preferably, the soil should have less than 15 percent passing a No. 200 sieve.

Compaction should be accomplished by placing the fill in lifts and mechanically compacting each lift to at least the specified dry density. The maximum lift thickness depends upon the soil type, moisture content, specified compaction and compaction equipment available. In general, loose lift thicknesses of about 12 inches should be used for sandy soils when utilizing large equipment and 4 inches when hand operated equipment is used. Compaction of any fill by flooding should not be permitted.

All foundation excavations should be evaluated by the geotechnical engineer or his representative to check that the bearing materials will provide suitable foundation support. If unsuitable materials are encountered, the geotechnical engineer would determine appropriate remedial alternatives.

If possible, all concrete for foundations should be placed within 24 hours from the time the excavation is made. If this is not practical, the foundation excavation should be adequately protected. Soils exposed in the bases of all excavation should be protected against any detrimental change in conditions such as from disturbance and rain. Surface run-off water must be drained away from all excavations and not be allowed to pond.

Foundations

With the aforementioned soil compaction improvements, the soils should be capable of supporting the proposed structure on shallow foundations. The existing soils and fill soils should be prepared as previously recommended to improve foundation support and reduce total and differential settlements.

Based on the anticipated construction and site preparation requirements recommended herein, it is our opinion that the building can be supported on shallow foundations designed for a net maximum allowable bearing pressure of 2,500 pounds per square foot (psf). The following geotechnical related recommendations should be used for design and construction of the foundations.

- The foundation and floor slab should bear on properly improved existing subgrade or on properly placed and compacted cohesionless (sand) fill.
- The soils to a depth of one foot below the footings and floor slabs and all new fill should be compacted to 95 percent of the soil's Modified Proctor (ASTM D-1557) density.

- Exterior footings should be embedded so that the bottom of the foundation is a minimum of 18 inches below the adjacent compacted grades.
- Strip or wall footings should be a minimum of 16 inches wide and pad or column footings (if applicable) should be a minimum of three feet wide. The minimum footing sizes should be used regardless of whether or not the foundation loads and allowable bearing pressures dictate a smaller size.
- All footings should be constructed in a "dry" fashion.
- Structural elements should be centered on the footings such that the load is transferred evenly unless the footings are proportioned for eccentric loads.

Settlement

The majority of expected settlement should occur during construction as dead loads are imposed. Total settlements of footings are estimated to be less than 1 inch, with differential settlement on the order of 50 percent of the total settlements. Total and differential settlements of these magnitudes are usually considered tolerable for the anticipated construction; however, the tolerance of the proposed structures to the predicted total and differential settlements should be confirmed by the structural engineer.

Floor Slab Recommendations

The subgrade should be covered by an effective vapor barrier to reduce the loss of water from the plastic concrete into the subgrade soils and to reduce the possibility of slab dampness due to moisture.

Warranty and Limitations of Study

Our professional services have been performed, our findings obtained, and our recommendations prepared in accordance with generally accepted geotechnical engineering principles and practices. This warranty is in lieu of all other warranties, either expressed or implied. Magnum Engineering, Inc. is not responsible for the independent conclusions, opinions or recommendations made by others based on the field exploration and laboratory test data presented in this report.

Soil conditions at other locations may differ from those encountered in the test borings, and the passage of time may cause the soils conditions to change from those described in this report.

This report is intended for use by the designers of this project. While we have no objections to it being provided for review by parties to this project, it is not a specification document and is not to be used as a part of the specifications. If desired, we can assist in the development of specifications for this project based upon our exploration.

The nature and extent of variation and change in the subsurface conditions at the site may not become evident until the course of construction. Construction monitoring by the geotechnical engineer or his representative is therefore considered necessary to verify the subsurface conditions and to check that the soils connected construction phases are properly carried out. If significant variations or changes are in evidence, it may be necessary to reevaluate the recommendations in this report.

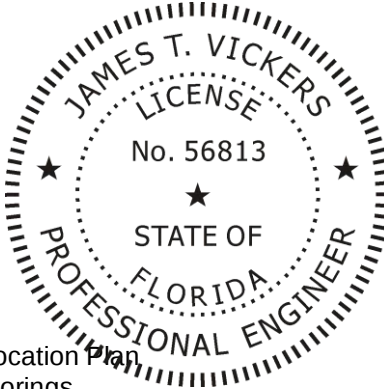
Furthermore, if the project characteristics are altered significantly from those discussed in this report, if the project information contained in this report is incorrect or if additional information becomes available, a review must be made by this office to determine if any modifications in the recommendations will be necessary.

Midway Training Facility – Geotechnical Services
Gadsden County, Florida
Page 5 of 5

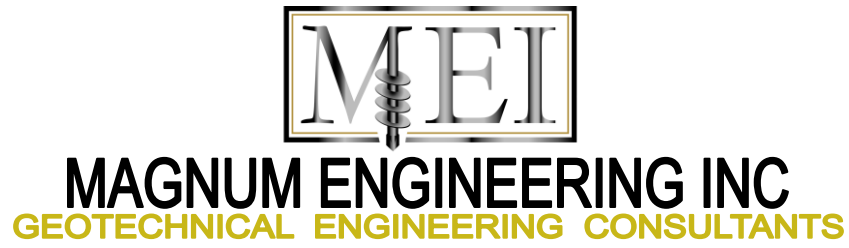
We hope this letter provides sufficient information for the present. If you have any questions or comments, please feel free to call.

Sincerely,
MAGNUM ENGINEERING, INC.

JAMES T. VICKERS, P.E.
Sr. Geotechnical Engineer
Florida Registration # 56813

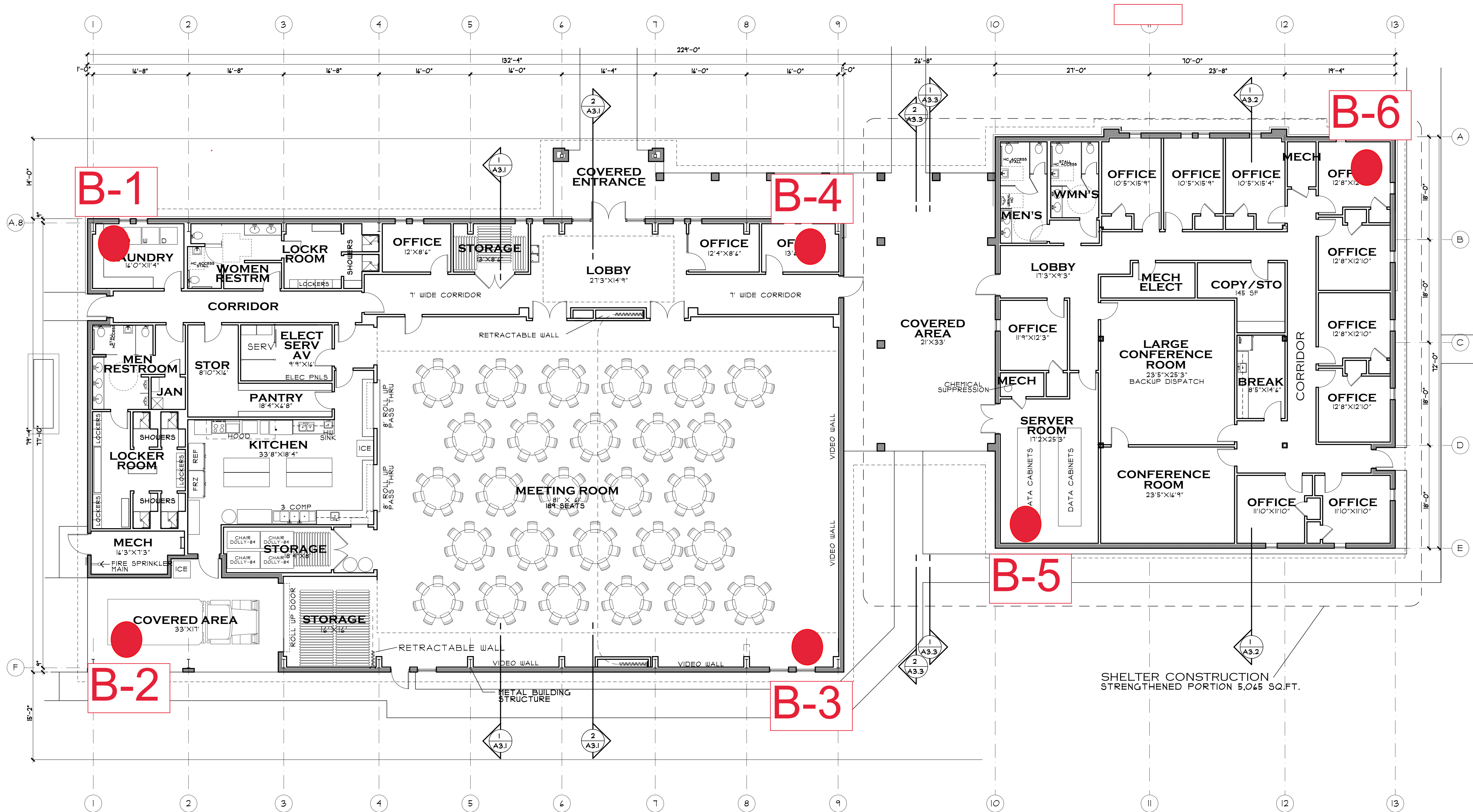


Attachments: Figure #1 – Boring Location Plan
Figure #2 - Logs of Borings



BORING LOCATION PLAN

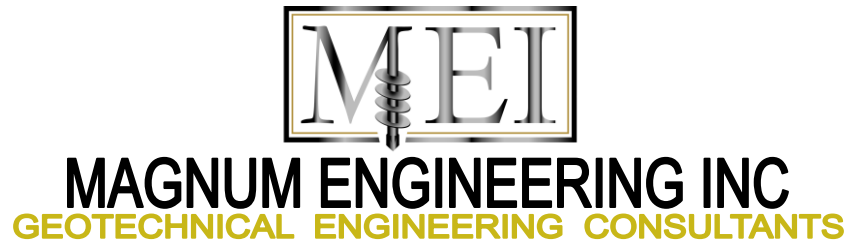
FIGURE # 1



COMBINED BUILDING FLOOR PLAN
SCALE: 1/8"=1'-0"



HEATED AND COOLED SPACE 14,985 SQ.FT.
TRAINING CENTER 9,920 SQ.FT.
OFFICE FACILITY 5,065 SQ.FT.
OTHER COVERED AREAS 1,950 SQ.FT.
OVERALL BUILDING AREA UNDER ROOF 16,935 SQ.FT.



LOGS OF BORINGS

FIGURE # 2



PAGE 1 OF 1

AFTER DRILLING ---

GEOTECH BH COLUMNS MIDWAY TRAINING FACILITY.GPJ GINT STD US LAB.GDT 11/14/23

[illegible]

[illegible]

[illegible]



PAGE 1 OF 1

PROJECT NAME Midway Training Facility

PROJECT LOCATION Gadsden County, Florida

GROUND ELEVATION	HOLE SIZE
------------------	-----------

GROUND WATER LEVELS:

▽ DEPTH TO GROUNDWATER AT TIME OF DRILLING 27.0 ft

CHECKED BY J. Vickers

ESTIMATED SEASONAL HIGH GWT ---

NOTES

AFTER DRILLING ---

[illegible]

GEOTECH BH COLUMNS MIDWAY TRAINING FACILITY.GPJ GINT STD US LAB.GDT 11/14/23

[illegible]

**DIVISION 3
CONCRETE**

COLORED CONCRETE FINISHING
SECTION 033520

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes: This Section specifies colored solvent soluble dye and dye materials for concrete surfaces.

1.2 RELATED REQUIREMENTS

- A. Section 03300 - Cast-in-Place Concrete.
- B. Grinding/polishing notes per architectural drawings.

1.3 REFERENCE STANDARDS

- A. Occupational Safety and Health Administration (OSHA):
 - 1. OSHA Hazard Communication Standard, 29 CFR 1910.1200.

1.4 ADMINISTRATIVE REQUIREMENTS

- A. Coordination: Coordinate colored solvent soluble dye for concrete work with work of other sections.
- B. Pre-installation Meetings: Conduct pre-installation meeting to verify project requirements, manufacturer's installation instructions and manufacturer's warranty requirements as applicable.
- C. Sequence with Other Work: Comply with colored solvent soluble dye for concrete manufacturer's written recommendations for sequencing construction operations.

1.5 ACTION SUBMITTALS

- A. General: Submit listed action submittals in accordance with Contract Conditions and Section 013400.
- B. Product Data: Submit as follows:
 - 1. Product data, including manufacturer's technical data sheets, for specified products.
 - 2. Manufacturer's standard color literature.
 - 3. Material Safety Data Sheets (MSDS).

1.6 INFORMATION SUBMITTALS

- A. Manufacturer's Instructions: Manufacturer's application and mixing instructions.
- B. Installer's Qualifications: Letter verifying Installer's qualifications.

1.7 CLOSEOUT SUBMITTALS

- A. Warranty: Submit warranty documents specified as applicable.
- B. Operation and Maintenance Data: Submit operation and maintenance data for installed products.
 - 1. Include: Manufacturer's instructions identifying maintenance requirements and material batch numbers.

1.8 QUALITY ASSURANCE

- A. Qualifications:
 - 1. Installer experienced in performing work of this section who has specialized in installation of work similar to that required for this project. Installer shall have minimum 4 years of experience successfully installing the manufactured product specified. Evidence of three successful projects shall be provided and must be found acceptable by the architect.
 - 2. Manufacturer capable of providing field service representation (on site) during construction and approving application method.

1.9 DELIVERY, STORAGE & HANDLING

- A. General: Comply with Section 016400.
- B. Ordering: Comply with manufacturer's ordering instructions and lead time requirements to avoid construction delays.
- C. Delivery:
 - 1. Deliver materials in manufacturer's original containers, with identification labels intact and in sizes to suit project.
 - 2. Deliver colored solvent soluble dye materials to project site in labeled containers, each bearing name and address of manufacturer.
- D. Storage and Protection:
 - 1. Store colored solvent soluble dye materials in containers tightly closed, upright and protected from exposure to dampness, freezing and other harmful weather conditions and at temperature conditions recommended by manufacturer.
 - 2. Keep colored solvent soluble dye materials protected against traffic and contamination by foreign materials.
 - 3. Store colored solvent soluble dye materials away from incompatible materials and populated work areas.

1.10 SITE CONDITIONS

- A. Project Ambient Conditions: Maintain materials, substrates and surrounding air temperature between 50 degrees F (10 degrees C) and 90 degrees F (32 degrees C) prior to, during and 72 hours after completion of colored solvent soluble dye materials work.

1.11 WARRANTY

- A. Project Warranty: Refer to Contract Conditions for project warranty provisions.
- B. Manufacturer's Warranty: Submit, for Owner's acceptance, manufacturer's standard warranty document executed by authorized company official. Manufacturer's warranty is in addition to and does not limit other rights Owner may have under Contract Documents.
- C. Warranty: Commencing on date of acceptance by Architect.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Ensure manufacturer has minimum 5 years experience in manufacturing colored solvent soluble dye similar to or exceeding requirements of project.

2.2 PROPRIETARY SYSTEMS

- A. Manufacturer: Ameripolish, Inc., 120 Commercial Avenue, Lowell, AR 72745; Telephone: (800) 592-9320, (479) 725-0033; Fax: (479) 725-0031; website: www.ameripolish.com.

2.3 MATERIALS

- A. Ameripolish Dye-N-Seal: Solvent soluble dye.
 - 1. Color: Select from standard manufacturer's color chart.
- B. Densifier: Ameripolish, Inc.
 - 1. Ameripolish 3D HS Densifier
- C. Stain Protector:
 - 1. Ameripolish 3D SP
 - 2. Ameripolish SR2
- D. Ameripolish EZ Etch: Chemical etching product.

2.4 ACCESSORIES

- A. Coating and Adhesive Stripping Material: In accordance with colored solvent soluble dye manufacturer's written recommendations.
- B. Degreaser Product: Ameripolish Strip and Clean.

PART 3 - EXECUTION

3.1 INSTALLERS

- A. Provide experienced and qualified workers to apply colored solvent soluble dye materials.

3.2 MANUFACTURERS INSTRUCTIONS

- A. Compliance: **Comply** with colored solvent soluble dye manufacturer's written data, including product technical bulletins, product catalog installation instructions, product carton installation instructions and Ameripolish Inc., technical sheets.

3.3 EXAMINATION

- A. Site Verification of Conditions:
 - 1. Prior to installation of colored solvent soluble dye materials, verify that conditions of substrates previously installed under other sections or contracts are acceptable for product installation in accordance with manufacturer's instructions.
 - 2. **Inform Architect of unacceptable conditions immediately upon discovery.**
 - 3. Proceed with installation only after unacceptable conditions have been remedied.
 - 4. Verify that fresh concrete is dry and has cured 28 days minimum.

3.4 PREPARATION

- A. Using stripping material, remove previous coating, adhesive or other substrate treatments in accordance with colored solvent soluble dye manufacturer's written recommendations.
- B. Remove oil or grease stains using degreasing product in accordance with colored solvent soluble dye manufacturer's written recommendations.
- C. Use chemical etching product on substrate per manufacturer's recommendations.
- D. Wash substrate with water in accordance with colored solvent soluble dye manufacturer's written instructions.
 - 1. Squeegee or vacuum excess water from substrate.
- E. Allow substrate to dry completely.
- F. Vacuum excess dust from substrate prior to applying dye.

3.5 INSTALLATION

- A. Provide a mock up of the color installation – 6' x 6' floor area or small room shall be prepared and approved by architect prior to proceeding with overall installation.
- B. Refer to grinding specifications in drawings for steps and timing of grinding & densifier application. Color applied prior to densifier.

- C. Apply colored solvent soluble dye to horizontal surfaces using pump sprayer with conical tip to achieve aesthetic and performance that meets project requirements.
- D. Residue Removal:
 - 1. Autoscrub residue from substrate.
 - 2. Perform second rinse with clean water. Rinse again if water remains discolored.
- E. Apply second coat of colored solvent soluble dye using same methodology as original coat.
 - 1. Allow colored solvent soluble dye to dry for at least one hour or until dye is dry before applying a second coat.
 - 2. Allow colored solvent soluble dye second coat to dry for 1 hour minimum or until dry prior to removing residue.
- F. Residue Removal:
 - 1. Autoscrub residue from substrate.
 - 2. Perform second rinse with clean water. Rinse again if water remains discolored.
- G. Densify concrete substrate using densifier as specified.
- H. Stain protect concrete substrate using stain protector as specified.

3.6 **DENSIFIER APPLICATION**

- A. Area to be Treated: Apply densifier to all interior concrete floors except floors with color textured concrete finishes and floors to receive resilient flooring.
- B. Examination and Preparation:
 - 1.Examine surfaces receiving densifier. Verify that surfaces conform to product manufacturer's requirements for substrate conditions.
 - 2.Vacuum and clean saw cut joints and surrounding area so that no dust remains to react with concrete finish material.
 - 3.Remove remnant of any temporary film forming curing compound prior to application of densifier. Remove compound by cleaning and scrubbing in accordance with manufacturer's instructions.
 - 4.Prior to application, scrub floor to remove latent salts. Do not proceed until unsatisfactory conditions have been corrected.
 - 5.Beginning of application indicates acceptance of existing conditions.
- C. Application:
 - 1.Application shall be performed by certified applicator in accordance with manufacturers published instructions.
 - 2.Schedule to begin 28 days after floor slab placement.
 - 3.Employ methods to ensure concrete surface is not damaged during application, including discoloration.
 - 4.Apply densifier finish at the rate recommended by manufacturer.
 - 5.Apply with low pressure sprayer with conical tip with enough coverage to keep concrete surface wet for minimum 20 minute period.

3.7 **STAIN PROTECTOR APPLICATION**

- A. Area to be Treated: Apply stain protector to all interior concrete floors except floors to receive resilient flooring.

- B. Examination and Preparation:
- 1.Examine surfaces receiving stain protector. Verify that surfaces conform to product manufacturer's requirements for substrate conditions.
 - 2.Vacuum and clean saw cut joints and surrounding area so that no dust remains to react with concrete finish material.
 - 3.Remove any foreign materials prior to application of stain protector. Remove compound by cleaning and scrubbing in accordance with manufacturer's instructions.
 - 4.Prior to application, scrub floor with water to remove latent salts. Do not proceed until unsatisfactory conditions have been corrected.
 - 5.Beginning of application indicates acceptance of existing conditions.
- C. Application:
- 1.Application shall be performed by certified applicator in accordance with manufacturers published instructions.
 - 2.Employ methods to ensure concrete surface is not damaged during application, including discoloration.
 - 3.Apply stain protector finish at the rate recommended by manufacturer.
 - 4.Apply with low pressure sprayer with conical tip and follow with microfiber applicator pad.
 - 5.Apply second coat of stain protector, apply over surfaces to which stain protector has been applied.
 - 6.Apply stain protector finish at twice coverage rate recommended by manufacturer; i.e. manufacturer recommended 2,000 SF – apply at 3,000 SF rate.
 - 7.Apply with low pressure sprayer with conical tip and follow with microfiber applicator pad.

3.8 **FIELD QUALITY CONTROL**

- A. Manufacturer's Field Services: Have manufacturer's technical representative schedule site visits to review work as follows:
1. Upon completion of work, after cleaning is carried out.

3.9 **CLEANING**

- A. Perform final cleanup in accordance with Section **017100**.

3.10 **PROTECTION**

- A. Protect installed concrete from damage during the overall project.
- B. Protect installed finish stained concrete from damage until end of project. Failure to protect the finish shall risk replacement of offending areas at the cost of the contractor.
- C. Repair damage to adjacent materials caused by work related to colored solvent soluble dye materials.

END OF SECTION

DIVISION 4
MASONRY
REFER TO DRAWINGS

**DIVISION 5
METALS
REFER TO DRAWINGS**

DIVISION 6
WOOD & PLASTIC

FINISH CARPENTRY

SECTION 062000

PART 1 - GENERAL

1.1 DESCRIPTION

- A. Work included: Install wood, nails, screws, and other items as needed and perform finish carpentry for the construction shown on the Drawings, as specified herein and as needed for a complete and proper installation.
- B. Related work:
 - 1. Documents affecting work of this Section include but are not necessarily limited to, General Conditions, Supplementary Conditions and Sections in Division 1 of these Specifications.

1.2 QUALITY ASSURANCE

- A. Use adequate numbers of skilled workmen who are thoroughly trained and experienced in the necessary crafts and who are completely familiar with the specified requirements and the methods needed for proper performance of the work of this Section.

1.3 PRODUCT HANDLING

- A. Comply with pertinent provisions of Section 01640.

PART 2 - PRODUCTS

2.1 GRADE STAMPS

- A. Identify lumber by the grade stamp of the Architectural Woodwork Institute or such other grade stamp as is approved in advance by the Architect.

2.2 MATERIALS

- A. Provide materials in the quantities needed for the Work as shown on the Drawings, and meeting or exceeding the following standards of quality;
 - 1. Interior Mouldings: Poplar, stain grade or paint grade as required based on finish called for elsewhere in the documents.

2.3 OTHER MATERIALS

- A. Provide other materials not specifically described but required for a complete and proper installation, as selected by the Contractor, subject to the approval of the Architect.

PART 3 - EXECUTION

3.1 SURFACE CONDITIONS

- A. Examine the areas and conditions under which work of this Section will be performed. Correct conditions detrimental to timely and proper completion of the Work. Do not proceed until unsatisfactory conditions are corrected.

3.2 WORKMANSHIP

- A. Produce joints which are true, tight, and well nailed with all members assembled in accordance with the Drawings.
- B. Jointing:
 - 1. Make joints to conceal shrinkage; miter exterior joints; cope interior joints; miter or scarf end-to-end joints.
 - 2. Install trim in pieces as long as possible, jointing only where solid support is obtained.
- C. Fastening:
 - 1. Install items straight, true, level, plumb and firmly anchored in place.
 - 2. Where blocking or backing is required, coordinate as necessary with other trades to ensure placement of required backing and blocking in a timely manner.
 - 3. Nail trim with finish nails of proper dimension to hold the member firmly in place without splitting the wood.
 - 4. On exposed work, set nails for putty.
 - 5. Screw, do not drive, wood screws. Wood screws may be started by driving and then screwed home.

3.3 INSTALLATION OF OTHER ITEMS

- A. Install items in strict accordance with the Drawings and the recommended methods of the manufacturer as approved by the Architect, anchoring firmly into position at the prescribed locations, straight, plumb and level.

3.4 FINISHING

- A. Sandpaper finished wood surfaces thoroughly as required to produce a uniformly smooth surface, always sanding in the direction of the grain.
- B. Apply sanding sealer to softwood surfaces and lightly sand, prior to staining.
- C. No coarse grained sandpaper mark, hammer mark, or other imperfection will be accepted.

3.5 CLEANING UP

- A. Keep the premises in a neat, safe, and orderly condition at all times during execution of this portion of the Work, free from accumulation of sawdust, cut-ends, and debris.
- C. Sweeping:
 - 1. At the end of each working day, and more often if necessary, thoroughly sweep surfaces where refuse from this portion of the work has settled.
 - 2. Remove the refuse to the area of the job site set aside for its storage.
 - 3. Upon completion of this portion of the Work, thoroughly broom clean all surfaces.

END OF SECTION

SECTION 064050
CABINETS AND FIXTURES

PART 1 - GENERAL

1.1 DESCRIPTION

- A. Work included: Provide vanity counters where shown on the Drawings, as specified herein, and as needed for a complete and proper installation.
- B. Related work:
 - 1. Documents affecting work of this Section include, but are not necessarily limited to, General Conditions, Supplementary Conditions, and Sections in Division I of these Specifications.
- C. Definitions:
 - 1. "Exposed work" includes all surfaces visible when doors and drawers are closed.
 - 2. "Concealed work" includes sleepers, web frames, dust panels, and other surfaces not usually visible after installation.

1.2 QUALITY ASSURANCE

- A. Use adequate numbers of skilled workmen who are thoroughly trained and experienced in the necessary crafts and who are completely familiar with the specified requirements and the methods needed for proper performance of the work of this Section.
- B. Work performed under this section shall comply with "Architectural Woodwork Quality Standards" of the Architectural Woodwork Institute.
- C. Identification of components:
 - 1. On a concealed but accessible surface of each item of the work of this Section, where approved by the Architect, plainly stamp the identifying number or numbers shown on the approved Shop Drawings for that item.

1.3 SUBMITTALS

- A. Comply with pertinent provisions of Section 01340.
- B. Product data: Within 15 calendar days after the Contractor has received the Owner's Notice to Proceed, submit:
 - 1. Materials list of items proposed to be provided under this Section;
 - 2. Shop Drawings in sufficient detail to show fabrication, installation, anchorage, and interface of the work of this Section with the work of adjacent trades:
 - a. Identify cabinets, fixtures, moldings, and other items in accordance with the design shown in the Drawings.
 - b. Show overall dimensions, and call specific attention to all dimensions and conditions which vary from those shown on the Drawings;
 - c. Indicate compliance with the selected Institute standards.

- C. Samples:
 - 1. Accompanying the Shop Drawings, submit Samples of all items of trim, plastic overlays, and similar items proposed to be provided under this Section.
 - 2. After general colors and types of finish have been selected by the Architect, prepare and submit Samples of the selected finishes on species of the actual cabinet and fixture material.
 - 3. Revise and resubmit the Samples as needed to secure the Architect's approval.

1.4 PRODUCT HANDLING

- A. Comply with pertinent provisions of Section 01640.
- B. Provide additional protection as needed to assure that the work of this Section remains undamaged during fabrication, installation, and the time between completion of installation and actual acceptance of the total Work.
- C. Do not deliver cabinets and fixture materials or products to the job site until concrete and plaster installations are completed and dry, nor until the building interior has attained a relative humidity of 50% to 55% at 70 degrees F.

PART 2 - PRODUCTS

2.1 WOOD

- A. General:
 - 1. Provide wood materials of the grades and species as called for in the following paragraphs of this Section.
 - 2. Provide solid stock lumber at all locations except where other material is specified or is called for on the Drawings.
- B. Hardwood lumber:
 - 1. For use as solid stock in all finish work, provide lumber having not more than 12% moisture content.
- C. Plywood :
 - 1. Provide only plywood fabricated with water-resistant glue by the hot plate method.
 - 2. Provide back veneers to properly balance the face veneers.
- D. Industrial Grade Board (plastic laminate exposed veneer):
 - 1. Provide 47 lb. density laminated with .030 vertical grade laminate.
 - 2. Provide melamine back veneers in semi-exposed locations unless noted otherwise.

2.2 MISCELLANEOUS MATERIALS

- A. Adhesives:
 - 1. For woodwork and millwork, use water resistant and mold resistant adhesive complying with Fed Spec MM-A-125, type II.
 - 2. For plastic laminates, use phenol, resorcinol, or melamine base, complying with Fed Spec MM-A-181, in type, grade, and class best suited for the intended use.

- B. Plastic laminates:
 - 1. Provide patterns and colors selected by the Architect from standard patterns and colors of products approved for use in this Work, and complying with NEMA LD3, in the following minimum thicknesses.
 - a. Horizontal surfaces: 0.050"

2.3 FABRICATION

- A. General:
 - 1. Fabricate and assemble units complete at the mill insofar as their dimensions will permit for transportation and proper handling.
 - 2. For units with sectional construction:
 - a. Accurately fit and align the separate parts.
 - b. Provide ample screw, glue-and-bolt blocks, drawbolts, tongues, grooves, splines, dowels, tenons, mortises, and other means of fastening to render the work of this Section substantial, rigid, and permanently secured in the proper position.
- B. Scribe members:
 - 1. Provide sufficient additional material to permit scribing to walls, floors, and related work.
 - 2. Provide adequate allowance for shrinkage occurring after installation.
- C. Framing and blocking:
 - 1. Assemble with bolted and screwed connections, securing to structural backings with cinch anchors, expansion screws, or toggle bolts as necessary.
 - 2. Half lap join all rails and stiles, neatly miter and member throughout, make butt joints flush and smooth, and make up permanent joints with water resistant glue.
 - 3. Assemble fixtures without face nails or face screws, except as needed to attach trim.
 - a. Countersink face nails and face screws, fill with plastic wood or wood plugs, sand smooth, and touch up to be nearly invisible.
 - b. Countersink the heads of all screws in every surface.
- D. Cut and fit the work of this Section as necessary to receive, clear, engage, or support other parts of the Work, and as needed for interface with electrical, plumbing, and other units.

PART 3 - EXECUTION

3.1 SURFACE CONDITIONS

- A. Examine the areas and conditions under which work of this Section will be performed. Correct conditions detrimental to timely and proper completion of the Work. Do not proceed until unsatisfactory conditions are corrected.

3.2 PREPARATION FOR INSTALLATION

- A. Coordinate as required with other trades to assure proper and adequate provision in the work of those trades for interface with the work of this Section.
- B. Make necessary measurements in the field to assure proper fit of shop fabricated items.

- C. Prior to start of installation, verify that the work of other trades is sufficiently complete to properly permit this installation to proceed.

3.3 INSTALLATION

- A. Install the work of this Section at the locations shown on the Drawings, and in accordance with the approved Shop Drawings.
 - 1. Scribe units to wall, floor, and other surfaces as appropriate, with not more than 1/32" clear between the cabinet or fixture and the abutting permanent surface, and with no change of clearance in excess of 0.01" in any 4".
 - 2. Set each unit square, level, plumb, and aligned within a tolerance of one in 1000 vertically and horizontally, and within 1/4" of the designated location for free-standing work.
- B. Coordinate the time of installation with availability of other trades to make required utility connections.
 - 1. Provide access panels as needed for connection and maintenance of utilities.
 - 2. Test each plumbing item through at least five operating cycles, and adjust as needed to achieve optimum operation.
- C. Upon completion of installation, thoroughly clean each item by use of only such cleaning materials as are recommended by the manufacturer of the item being cleaned.
- D. Touch-up scratches and abrasions to be completely invisible to the unaided eye from a distance of five feet.

END OF SECTION

DIVISION 7
THERMAL & MOISTURE PROTECTION

SECTION 072100
BUILDING INSULATION

PART 1 - GENERAL

1.1 DESCRIPTION

- A. Work included: Provide building insulation where shown on the Drawings, as specified herein, and as needed for a complete and proper installation.
- B. Related work:
 - 1. Documents affecting work of this Section include, but are not necessarily limited to Section 13120 and Sections in Division I of these Specifications.

1.2 QUALITY ASSURANCE

- A. Use adequate numbers of skilled workmen who are thoroughly trained and experienced in the necessary crafts and who are completely familiar with the specified requirements and the methods needed for proper performance of the work of this Section.

1.3 PRODUCT HANDLING

- A. Comply with pertinent provisions of Section 016400.

PART 2 - PRODUCTS

2.1 MATERIALS

- A. Provide the following building insulation where shown on the Drawings or otherwise needed to achieve the degree of insulation required under pertinent regulations of governmental agencies having jurisdiction.

- 1. New exterior masonry walls: foam insulation to fill all open, non reinforced or grouted cells.
Foamed-In-Place Masonry Insulation: Either two component thermal insulation produced by combining a plastic resin and catalyst foaming agent surfactant or lightweight cement insulation to produce foam insulation in the hollow cores of hollow unit masonry walls.

Surface Burning Characteristics: Maximum flame spread, smoke developed and fuel contributed of 0, 5 and 0 respectively.

Combustion Characteristics: Must be noncombustible, Class A building material.

Thermal Values: "R" Value of 4.91/inch @ 32 degrees F mean; ASTM C-177.

Approved manufacturers of Foamed-in-Place Masonry Insulation: (others may be used upon Architect approval.)

- a. "Core-Fill 500" - Tailored Chemical Products, P.O. Drawer 4186,
Hickory, N.C. 28663, (800) 627-1687
- b. Air Krete, Inc - P.O. Box 380 Weedsport, NY 13166

2. Where called for inside face of masonry walls in conditioned space: 1.5" thick extruded polystyrene insulation board "Styrofoam Cavitymate Plus" by DOW Building Solutions, with minimum value of R-10.
3. Where called for inside face of masonry walls in metal studwall: Batt insulations shall be as manufactured by Owens Corning, Certain Teed Corporation, or Johns Manville.
4. Acoustical Insulation at interior walls: Mineral fiber batts, R-11 unfaced. Install unfaced acoustical insulation in all interior walls where indicated on the floor plan – insulation shall run to top of wall.
5. Roof insulation above metal roof deck at metal and low slope roofing: See roofing sections.

2.2 OTHER MATERIALS

- A. Provide other materials, not specifically described but required for a complete and proper installation, as selected by the Contractor subject to the approval of the Architect.

PART 3 - EXECUTION

3.1 SURFACE CONDITIONS

- A. Examine the areas and conditions under which work of this Section will be performed. Correct conditions detrimental to timely and proper completion of the Work. Do not proceed until unsatisfactory conditions are corrected.
- B. Remove, or protect against, projections in construction framing which may damage or prevent proper insulation.

3.2 INSTALLATION - GENERAL

- A. Install the work of this Section in strict accordance with the original design, requirements of governmental agencies having jurisdiction, and the manufacturer's recommended installation procedures as approved by the Architect, anchoring all components firmly into position.

3.3 INSTALLATION – RIGID INSULATION

- A. Install rigid insulation against masonry walls and fasten with pin/washer fasteners for minimum 1" embedment in masonry. Install per manufacturers' requirements.

3.4 INSTALLATION - MASONRY FOAM FILL

- A. Foamed-in-place general. Install foamed-in-place insulation from interior, or as specified, prior to installation of interior finish work and after all masonry and structural concrete work is in place; comply with manufacturer's instructions.
- B. Foamed-in-place Installation: Fill all open cells and voids in hollow concrete masonry walls where shown on drawings. The foam insulation shall be pressure injected through a series of 5/8" to 7/8" holes drilled into every vertical column of block cells (every 8" on center) beginning at an approximate height of four (4) feet from finished floor level. Repeat this procedure at an approximate height of ten (10) feet above the first horizontal row of holes

(or as needed) until the void is completely filled. Patch holes with mortar and score to resemble existing surface.

- C. Inspect all openings in masonry walls where pipe, conduit, ducts, or similar penetrations have been made. Do not proceed with installation of foam insulation until all penetrations have been sealed to prevent leakage of insulation from the masonry cells.

3.5 INSTALLATION - BATTS

- A. Install per manufacturer's specifications. Provide required clearance between fiberglass batt insulation and light fixtures if installed in suspended ceilings.

END OF SECTION

SECTION 074000

METAL ROOFING AND WALL PANELS

PART 1 – GENERAL

1.1 DESCRIPTION

- A. Work included: Provide standing seam metal roofing, and metal wall panels, each complete with flashings, closures and miscellaneous trim and accessories as called for in the Drawings, as specified herein and as needed for a complete and proper installation.
- B. Related Work:
 - 1. Documents affecting work of this Section include, but are not necessarily limited to, General Conditions, Supplementary Conditions, and Sections in Division 1 of these Specifications.
 - 2. Section 072100: Building Insulation.
 - 3. Section 076000: Flashing and Sheetmetal.
 - 4. Section 079200: Sealants and Calking.

1.2 QUALITY ASSURANCE

- A. Installer Qualifications: Installer experienced in performing work of this section who has specialized in the installation of work similar to that required for this project for a minimum of ten years.
- B. Sheet Metal Industry Standard: Comply with Sheet Metal and Air Conditioning Contractors National Association (SMACNA) Architectural Sheet Metal Manual.

1.3 REFERENCES

- A. American Society for Testing and Materials (ASTM):
 - 1. ASTM A653/A653M Standard Specification for Steel Sheets, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process.
 - 2. ASTM A792/A792M Standard Specification for Steel Sheet, 55% Aluminum-Zinc Alloy Coated by the Hot Dip Process.
 - 3. ASTM B209 Standard Specification for Aluminum and Aluminum-Alloy Sheet and Plate.
 - 4. ASTM D2247 Standard Practice for Testing Water Resistance of Coatings in 100% Relative Humidity.
 - 5. ASTM G90 Standard Practice for Performing Accelerated Outdoor Weathering of Non-Metalic Materials Using Concentrated Natural Sunlight.

1.4 SUBMITTALS

- A. Comply with pertinent provisions of Section 013400.
- B. Product data: Within 35 calendar days after the Contractor has received the Owner's Notice to Proceed, submit:

1. Detailed drawings showing layout of panels, anchoring details, joint details, trim, flashing and accessories. Show details of weatherproofing, terminations and penetrations of metal work.
 2. Samples of roofing material with factory finish and color samples. Submit samples of for each product requiring color selection, 2 sets of manufacturer's sample chips representing full range of colors and finishes available.
 3. Test results indicating compliance with the minimum requirements of the specifications
- C. Calculations, signed and sealed by a Florida Registered Engineer, verifying roof panel and attachment method resists wind pressures imposed on it pursuant to Florida Building Code, current edition and with specified performance criteria. Provide pullout calculations for anchorage to purlins and panel clips
- D. Shop Drawings: It is the responsibility of the Installer to prepare detailed shop drawings that adapt proposed roof system and configuration of roof system to conditions of this Project and specified requirements. Shop drawings shall be reviewed by manufacturer before submittal to the Architect. Installer shall recommend and make any detail modifications required to insure a proper and watertight system.
1. Include metal thickness and finishes, panel lengths, joining details, anchorage details, flashings and provisions for termination and penetrations. Indicate framing member, purlin and panel clip locations, thermal expansion provisions, bracing and any supplemental supports. Indicate spacing for all fasteners.
 2. Provide manufacturer's instructions for storage, handling and installation, and standard construction details for conditions pertinent to this Project.
- E. Closeout Submittals: Submit the following:
1. Operation and Maintenance Data: Operation and maintenance data for installed products in accordance with Division 1. Include methods for maintaining installed products and precautions against cleaning materials detrimental to finishes and performance.

1.5 DESIGN REQUIREMENTS

- A. Materials:
1. Continuous, one-piece prefinished, mechanically seamed single length roof panels.
- B. Thermal Movement:
1. Completed metal roofing and flashing system shall be capable of withstanding expansion and contraction of components caused by changes in temperature without buckling, producing excess stress on structure, anchors or fasteners, or reducing performance ability.
 2. Interface between panel and expansion clip shall provide for applicable thermal movement in each direction along the longitudinal direction.
 3. Location and sizes of metal roofing rigid connectors shall be as indicated on engineer's certification and located on shop drawings.

1.6 DELIVERY, STORAGE AND HANDLING

- A. Upon receipt of panels and other materials, examine the shipment for damage and completeness.
- B. Materials shall be packed, shipped and stored in waterproof wrapping paper.
- C. Store materials in a clean, dry place. Elevate ends of roof panels to provide for moisture runoff. Do not store panels with strippable, protective finish in the sun.
- D. Stack all prefinished material to prevent twisting, bending, abrasion, scratching and denting, and to allow for adequate ventilation.
- E. Maintain dry, heated storage area for products of this section until installation of products.

1.7 WARRANTY

- A. Material paint finish shall have a twenty-year guarantee against cracking, peeling and fading.
- B. Galvalume finish materials shall have a twenty-year guarantee against failure due to corrosion, rupture or perforation.
- C. Provide Watertightness Warranty executed jointly by the roof system manufacturer and installer which warrants the installed system to be free of leaks and free from defects in materials and workmanship for a period of twenty (20) years from date of substantial completion of the project. In this time period, the owner shall be required no out-of-pocket expenses toward corrections or repairs of the system.

PART 2 – PRODUCTS

2.1 ACCEPTABLE MANUFACTURERS

- A. Materials and systems described in this Specification are based on those manufactured by McElroy Metal, Inc., 1500 Hamilton Rd., Bossier City, LA 71111: 800-950-6531. Other acceptable manufacturer's are Berridge Manufacturing Company, Inc., San Antonio, Texas; Metal Building Components, L.P., Houston, Texas.
- B. Substitutions to the materials and products specified shall be submitted in advance for review and approval, complying with pertinent provisions of Section 01340.

2.2 SHEET MATERIALS

- A. Prefinished Metal shall be Hot-Dipped Galvanized, complying with ASTM A446-85 Grade C, G90 Coating, A525-86 24 gauge or 26 gauge (thickness as specified) core steel or prefinished Galvalume – ASTM 792, AZ-55 coating; 24 gauge or 26 gauge sheet (thickness as specified.)
- B. Roofing material: Metal shall be Galvalume steel sheet, complying with ASTM 792-86, AZ 55, "Satin Finish".

- C. Paint finish shall be Kynar 500 Fluoropolymer coating, applied by the manufacturer on a continuous coil coating line. Bottom side of panel shall be coated with primer with a dry film thickness of 0.25 mil. Finish shall conform to all tests for adhesion, flexibility and longevity as specified by the Kynar 500 finish supplier.
- D. Strippable film shall be applied to the top side of the painted coil to protect the finish during fabrication, shipping and field handling. Strippable film shall be removed before installation.

2.3 ACCESSORY MATERIALS

- A. Fasteners: Stainless Steel with washers where required.
- B. Sealant: As specified in Section 079200 and as recommended by the roofing panel manufacturer.
- C. Flashings: Same material and finish as roof panels, break-formed to profiles indicated on drawings and as necessary for complete installation.

2.4 STANDING SEAM ROOF PANEL

- A. Provide vertical leg standing seam metal panels with male/female seams to be mechanically interlocked at jobsite with mechanical seamer specifically designed for seam profile.
 - 1. Panel Style: "Maxima" by McElroy Metal, Inc. 24 gauge or approved equal.
See other acceptable manufacturers above.
 - 2. Size: 2" high seam by 16" wide, lengths indicated on drawings.
 - 3. Panel Surface: flat pan.
 - 4. Finish: The roofing panel and trim color shall be color as selected from standard line.
- B. Concealed Clips:
 - 1. Standing seam metal roof shall be fastened to framing members with concealed anchors of minimum G-90 galvanized steel or stainless steel or other properly coated metal of adequate strength and wear resistance to meet or exceed minimum performance requirements of the Specification.
 - 2. Clips shall accompany panel movement in each direction along longitudinal direction to adequately accommodate temperature differential and panel movement of this project.
 - 3. Manufacturer shall design fastener device and spacing of fasteners to maintain required wind uplift resistance at connection.

2.5 METAL SOFFITS

- 1. Profile based on McElroy "Marquee Lok" soffit panel with single pencil rib. Major longitudinal ribs .375" deep, spaced 6" on center; minor longitudinal ribs centered between major ribs. Vented if called for on the drawings.
- 2. Size: 12" cover width, lengths indicated on drawings.
- 3. Material: Galvalume steel sheet conforming to ASTM A792, AZ55 coating; 24 gauge sheet thickness.

4. Finish: Galvalume Plus.

2.6 ACCESSORIES

A. Fasteners:

1. Any exposed screw fasteners shall be 300 series alloy stainless steel with integrally bonded neoprene stainless steel washers under the heads, painted with urethane finish to match roofing.
2. Any exposed rivets shall be self-plugging type minimum 3/16" diameter, 300 series alloy stainless steel with stainless steel stems. If located where drainage from possible head leakage does not pass to interior, seal washers are not required, otherwise, use EPDM washers under the heads.
3. Concealed fasteners shall be sized to meet pullout requirements in specific thickness of support material.
4. There shall be no exposed fasteners except to fasten flashings, at fixing points, or as indicate on the drawings.

B. Closures:

1. Ridge and hip closures shall be factory fabricated from 24-gauge sheet metal matching roof panels. Hip closures shall be field cut. Ridge closures are to be die-formed to match panel configuration.

PART 3 – EXECUTION

3.1 SURFACE CONDITIONS

- A. Examine the areas and conditions under which work of this Section will be performed. Correct conditions detrimental to timely and proper completion of the Work. Do not proceed until unsatisfactory conditions are corrected.
- B. Roof purlins, wall purlins and substructure:
 1. Verify that the components are clean and smooth, free of depressions, waves or projections that would hinder the installation of the system.
 2. Coordinate locations of roof penetrations with work to be installed, making provision for plumbing vents, ductwork, etc.

3.2 PREPARATION

- A. Coordinate metal roofing with other work, drainage, flashing and trim, substrates, parapets, copings, walls and other adjoining work to provide a non-corrosive leakproof installation.
- B. Prevent galvanic action of dissimilar metals.

3.3 INSTALLATION

- A. Comply with manufacturer's standard instructions and conform to standards set forth in the Architectural Sheet Metal manual published by SMACNA, in order to achieve a watertight installation.

- B. Install panels in such a manner that horizontal lines are true and level and vertical lines are plumb.
 - 1. Variation from Plumb: Maximum 1/8".
 - 2. Variation from Level: Maximum 1/8".
 - 3. Variation from True Plane: Maximum 1/8".
 - 4. Variation from True Position: Maximum 1/4"
- C. Install starter and edge trim before installing roof panels.
- D. Remove protective strippable film prior to installation of roof panels.
- E. Attach panels using manufacturer's standard clips and fasteners, spaced in accordance with approved shop drawings.
- F. Install sealant for preformed roofing panels as shown and approved on shop drawings.
- G. Do not allow panels or trim to come into contact with dissimilar materials.
- H. Do not allow traffic on completed roof. If required, provide cushioned walk boards.
- I. Protect installed roof panels and trim from damage caused by adjacent construction until completion of installation.
- J. Remove and replace any panels or components that are damaged beyond successful repair acceptable to the Architect.

3.4 CLEANING

- A. Clean any grease, finger marks or stains from the panels per manufacturer's recommendations.
- B. Remove all scrap and construction debris from the site to the areas approved for their storage.

END OF SECTION

SECTION 075400

FULLY ADHERED TPO SYSTEM SPECIFICATION

PART 1 – GENERAL

1.1 DESCRIPTION

A. Scope:

1. Furnish and install a Fully Adhered TPO Roofing Membrane with flashings and accessories necessary to comprise a roofing system. The Mule-Hide TPO products and accessories are basis of design and shall be installed in strict compliance with current specifications and drawings as published by the manufacturer.
2. The Mule-Hide Fully Adhered TPO (Thermoplastic Polyolefin) Membrane Roof System utilizes a 60-mil (.060 inch) thick reinforced TPO sheet. The TPO membrane is fully adhered to the substrate with bonding adhesive. Adjoining sheets and end laps are overlapped a minimum of 3 inches and welded with a robotic welder. The field membrane is secured at all changes in plane greater than 2" per foot. Note: All membrane thicknesses listed in this specification are nominal thicknesses.

B. Related Work:

The work includes, but is not necessarily limited to the installation of:

1. Wood Blocking (Nailers)
2. Insulation
3. Fasteners
4. Roof Membrane
5. Roof Membrane Flashings
6. Metal Flashings
7. Adhesives
8. Sealants
9. Walkways

Note: Adhere to industry standards (SMACNA) for the installation of any metalwork.

C. General Design Considerations

1. The roofing portion of this work shall utilize the specified Mule-Hide products.
2. Small incidental areas of ponded water will not impact the performance of this roofing system; however, in accordance with industry standards, the roofing assembly should be designed to prevent ponding of water on the roof for prolonged periods (longer than 48 hours). Good roofing practice dictates proper drainage to prevent possible excessive live load and, in the event of a roof leak, to minimize potential interior damage to the roofing assembly and to the interior of the building.
3. Any existing wet insulation and membrane shall be removed. An appropriate and compatible material shall be used as filler for voids created by removal of old insulation or membrane.
4. Regardless of the type of membrane or assembly selected, any loose flashings at the perimeter, roof drains and roof penetrations must be removed.

1.2 QUALITY ASSURANCE

- A. The Roofing System must be installed in compliance with the manufacturer's published specifications and details by an independent manufacturer's warranty eligible contractor.
- B. There shall be no deviations from this specification or the manufacturer's standard details without prior written approval from manufacturer and architect.
- C. Upon completion of the installation according to the terms and conditions stated in this specification and in accordance to the information given in the Warranty Application, Pre-Job survey form and any additional approvals which might have been given by the manufacturer, an authorized representative of the manufacturer shall perform an on-site inspection of the roof to verify that all installation and material requirements have been met. Contractor shall coordinate inspection and notify Architect 5 days prior to date and time of inspection.

1.3 SUBMITTALS

- A. Prior to the proceeding with any work, the roofing contractor shall submit to the Architect the following items:
 - 1. Copies of manufacturer's specifications and published product data.
 - 2. Samples of each material to be used in the roof system.
 - 3. Specimen copy of warranty
 - 4. Certification from insulation, roofing and accessory components manufacturers that all materials supplied comply with identified ASTM and industry standards.
- B. Submit to Mule-Hide, prior to the job start, a Heat-Weld System Warranty Application to be reviewed by the Mule-Hide Technical Department to determine the acceptability of the project based on the information provided.
 - 1. The Heat-Weld System Warranty Application ("Warranty Application") must be completely filled out and should be accompanied with a copy of the written roof specification provided by the building owner/designer (if available). Also included should be any requests for deviations to Mule-Hide's standard published specification and details.
 - 2. A roof drawing shall be submitted with the Warranty Application indicating all dimensions and locations of all penetrations.

1.4 PRODUCT DELIVERY, STORAGE AND HANDLING

- A. All products delivered to the job site shall be in their original unopened containers or wrappings and clearly labeled with the manufacturer's name, product identification and date of manufacture.
- B. Protect all materials from damage during transit, storage and delivery to the job site. Place all materials on pallets and protect from moisture.
- C. Store all materials in a dry, clean area protected from the elements. All rolls of membrane shall be stored flat on pallets.
- D. All adhesive and caulking shall be stored at temperatures between 60°F and 80°F. Materials

exposed to lower temperatures affect the workability and performance of the product. Products shall be restored to the above temperature prior to use.

E. All flammable materials shall be stored in a cool, dry area away from open flames and sparks. Follow precautions outlined on containers or supplied by the material manufacturer/supplier.

F. All materials determined as being damaged (confirmed by Mule-Hide) due to improper storage on the job site are to be replaced with new materials.

1.5 JOB CONDITIONS

A. TPO roofing materials may be installed in temperatures below 40° F but only after consultation with the manufacturer as special precautions or procedures may be necessary. The performance of the materials, installation costs and production rates may be affected.

B. The General Contractor or the building owner shall be responsible for providing adequate surfaces and structures to receive the insulation, roofing system and related sheet metal necessary for the successful completion of the project.

C. Only as much new roofing as can be made watertight each day shall be installed each day. This includes all flashing work.

D. All substrates to receive new insulation, membrane or flashing shall be thoroughly dry. Should surface moisture occur, the contractor shall provide adequate equipment to dry the substrate prior to application of new material.

E. Prior to and during application, all dirt, debris and dust shall be removed from surfaces to be roofed for both new and reroofing substrates.

F. On all projects where the Fully Adhered TPO system is specified, it is the responsibility of the independent roofing contractor to have the owner or owner's representative verify the condition of the deck or substrate and to confirm the roof deck can withstand the additional load.

G. Precautions shall be taken to prevent wind blow-off or wind damage during the course of the roofing application. This may necessitate additional securement of temporary construction, materials and equipment.

H. The contractor shall verify and ensure that all roof drain lines are unblocked before starting work. Any blockages found shall be reported to the owner's representative and manufacturer in writing.

I. Temporary water stops shall be installed at the end of each day's work. Temporary water stops shall be removed at the start of the next day's work and disposed of properly. Water stops shall be compatible with all materials.

J. Do not install the roofing membrane in direct contact with any product containing coal tar pitch, creosote or penta-based materials. Consult the manufacturer for special installation requirements.

K. Do not allow contaminants such as petroleum, grease, acid, solvents, vegetable or mineral oil, animal oil, animal fat, etc. or direct steam venting to come into direct contact with the roofing membrane. Contact manufacturer in such situation occurs.

L. The contractor shall follow and comply with all safety regulations as recommended by OSHA.

M. All work shall be scheduled and executed without exposing interior building areas to the effects of inclement weather. The existing building and its contents shall be protected against all risks.

N. Arrange work sequence to avoid use of newly constructed roofing for storage, walking surfaces and equipment movement. Contractor shall provide all necessary protection and barriers to segregate the work areas and prevent damage to adjacent areas. If excessive traffic over newly installed membrane is necessary, contractor shall provide plywood or polyester felt protection to prevent damage. All damaged materials shall be replaced with new materials.

O. All existing roofing materials to be removed for construction shall be immediately removed from the construction site to a dumping area authorized to receive such debris. Any hazardous materials such as asbestos or materials containing asbestos fibers shall be removed and disposed of in accordance with applicable City, State and Federal requirements.

P. Any unusual or concealed condition discovered during the course of the work is to be reported immediately in writing to the owner and manufacturer. Work may not occur until resolution of the problems.

Q. On structural concrete decks, when a vapor retarder is not used, gaps in the deck along the perimeter and around penetrations must be sealed. If tilt-up panels are present, vertical joints between panels must be sealed as well. Sealing these areas will help prevent infiltration of hot humid air and possible moisture contamination resulting from condensation. This is specifically important when adhesive is used to attach the roof insulation.

R. All local building codes, energy codes and requirements should be followed where applicable. It is the roofing contractor's sole responsibility to determine and ensure that the roofing system selected complies with all local codes and requirements.

S. Both interior and exterior building areas affected by construction shall be cleaned up and any damaged areas shall be repaired to the owner's satisfaction.

T. When using heat-welding equipment, always review the equipment manufacturer's instructions, precautions and warnings.

1.6 WARRANTIES

A. Mule-Hide's Standard System Warranty

The Standard warranty is an NDL ("No Dollar Limit"), labor and material warranty that covers only the Mule-Hide labeled membrane and accessories that comprise the Mule-Hide Roof System, other components supplied or approved in writing by Mule-Hide and exclusively installed by an independent Mule-Hide Warranty Eligible Contractor. Applicator must submit a Warranty Application and the appropriate fee to Mule-Hide. Standard warranties require inspections by a Mule-Hide representative.

PART 2 - PRODUCTS

2.1 GENERAL

A. The components of the Fully Adhered TPO Membrane Roof System are to be products manufactured or supplied by single manufacturer.

B. Components other than those supplied or manufactured by roofing system manufacturer may be submitted for review and acceptance.

2.2 ROOFING MEMBRANE

The roofing membrane shall be 60 mils (.060 inch) thick. The design basis is Mule-Hide TPO-c membrane - a polyester scrim reinforced thermoplastic polyolefin roofing membrane that meets and exceeds the requirements of ASTM D6878 Standard Specification for Thermoplastic Polyolefin Based Sheet Roofing. Refer to the Product Data Sheets for physical properties and additional information.

2.3 ACCESSORY MATERIALS

The following Mule-Hide materials must be used to install Mule-Hide Roof Systems. Mule-Hide will not warrant any application where another manufacturer's product is substituted for a Mule-Hide product. **All products listed below are physically and chemically compatible with each other.**

A. Helix® Max Low-Rise Adhesive, Helix® Max Low-Rise Adhesive 5-Gallon Jug, Helix® Max Low-Rise Adhesive Dual Tank, and Helix® Max Low-Rise Adhesive Dual Cartridge (Helix Max Low-Rise Adhesive) are a two-component, low-rise, construction grade, polyurethane foam adhesive designed to adhere approved roof insulations, thermal barriers, cover boards and fleece backed single-ply membranes to acceptable substrates. This VOC, CFC, HCFC and solvent free adhesive is quickly and easily applied.

1. Depending on the packaging and delivery option selected, these products can be installed in continuous beads, full spray, or splatter applications. Not all products have the same options so review of the product data sheets is required to ensure proper use.

B. Helix® Low-Rise Adhesive is a two-component, low-rise, construction grade, polyurethane foam adhesive designed to adhere approved roof insulations, thermal barriers, or cover boards to acceptable substrates, and is available in multiple packaging options; 15 and 50 gallon drums, Dual Tanks, and Dual Cartridges.

C. Mule-Hide TPO Bonding Adhesive - A solvent-based rubberized adhesive used for bonding Mule-Hide TPO-c Membrane to various vertical substrates and insulation boards. Mule-Hide TPO Bonding Adhesive is a two-surface contact adhesive that is applied to both the underside of the membrane and substrate surface. This product may be used with TPO field membrane and flashing membrane. Adhesive is compatible with polyisocyanurate, wood fiberboard insulations, fiberglass-faced gypsum panels, concrete, masonry, metal and wood surfaces.

D. Mule-Hide Low VOC Bonding Adhesive - A high strength solvent-based contact adhesive that allows bonding of TPO membrane to various porous and non-porous substrates. It is specially formulated using a blend of VOC exempt and non-exempt solvents to meet the < 250 g/l VOC content requirements of the OTC Model Rule for Single Ply Roofing Adhesives.

E. AeroWeb – A low VOC contact adhesive used to adhere membranes to various substrates, and prime surfaces prior to the application of F5 Air & Vapor Retarder. It features a quick dry time and ease of application from the self-contained pressurized cylinder.

F. Mule-Hide Low VOC Bonding Adhesive - 1168 – A high strength solvent-based contact adhesive that allows bonding of TPO membrane to various porous and non-porous substrates. It is specially formulated using a blend of VOC exempt and non-exempt solvents to meet the < 250 g/l VOC content requirements of the OTC Model Rule for Single Ply Roofing Adhesives. **This product COMPLIES with the following California counties' VOC regulations:** Alameda, Contra Costa, El Dorado, Los Angeles, Marin, Napa, Orange, Riverside, Sacramento, San Bernardino, San Diego, San Francisco, San Mateo, Santa Clara, Solano, Sonoma, and Tehama.

G. Aqua Base 120 Bonding Adhesive – A water base adhesive used to bond Mule-Hide TPO-c membrane to various vertical substrates and insulation boards. Aqua Base 120 is applied as a two-sided contact adhesive when used with standard (non-fleece back) TPO membranes, or as a single-side, wet lay-in adhesive when used with Mule-Hide Fleece Back TPO membrane.

H. Mule-Hide TPO Primer - A high-solids-content, clear (translucent color), polymer-based splice primer used to prepare TPO membrane for improved adhesion to pressure-sensitive TPO accessories such as: RUSS Strips, TPO Pressure Sensitive Cover Strips, Uncured Flashing Tapes and Cured Cover Tapes. Mule-Hide TPO Primer is required to prepare TPO membrane surfaces prior to the application of any pressure sensitive Mule-Hide accessories.

I. Mule-Hide Low VOC Primer - a solvent-based product designed to prepare TPO membrane for improved adhesion to pressure-sensitive TPO accessories such as: RUSS Strips, TPO Pressure Sensitive Cover Strips, Uncured Flashing Tapes and Cured Cover Tapes. This Low-VOC product is ideal for use in states where VOC content is a concern.

J. Mule-Hide TPO Flashing - a non-reinforced, .060-inch thick material primarily used to seal details where field fabrication is necessary, such as drain details, pipe flashings, pitch pocket flashings, seaming joints of the Mule-Hide TPO Coated Metal, and any place where reinforced membrane is not practical.

K. Mule-Hide TPO Universal Corners - .060-inch thick pre-molded, non-reinforced TPO material. They are uniform in shape and size and provide water tightness at corners formed by TPO coated metal and flashing membrane. They provide a neat, finished look to building corners, curbs and parapet flashings with no cutting or stretching required. Universal Corners are available in white only.

L. Mule-Hide TPO Outside Corners – are pre-molded and are used for flashing outside corners on a variety of details. Installation is fast and easy with no cutting or stretching required. TPO Outside Corners are available in white, gray, and tan.

M. Mule-Hide TPO Inside Corners – are pre-molded and are used for flashing inside corners on a variety of details. Installation is fast and easy with no cutting or stretching required. TPO Inside Corners are available in white, gray, and tan.

N. Mule-Hide Weathered Membrane Cleaner - Used to clean in-service TPO-c membrane prior to the welding process. This cleaner helps to loosen and remove dirt and other contaminants from the surface of the TPO-c membranes and leaves a suitable surface for welding or the subsequent application of TPO Primer.

O. Mule-Hide TPO Pipe Seal - An injection molded, pre-formed flashing for pipes made of Mule-Hide non-reinforced TPO material. They are designed to add ease to the installation process while offering increased watertight security and improved aesthetics. TPO Pipe Seals are designed as an economical flashing for single pipe penetrations on Mule-Hide TPO-c Membrane roof systems. The TPO Pipe Seals can be used wherever the TPO Pipe Seals may be slipped over the top of the pipe.

P. Mule-Hide TPO T-Joint Cover - 60-mil non-reinforced flashing cut into a 4.5" diameter circle used to seal step-offs at splice intersections. Installation is mandatory on all 60-mil and 80-mil TPO systems and on all jobs warranted longer than 15 years.

Q. Mule-Hide TPO Coated Metal – 24-gauge, galvanized steel to which is laminated 35 mils (.035" thick) of Mule-Hide non-reinforced TPO Membrane used for flashing and edge metal detailing.

R. Mule-Hide All-Purpose Bar ("A-P Bar") - an extruded aluminum bar, 50 mils (.050") thick, used to terminate adhered reinforced membrane vertical flashings in certain constructions. Mule-Hide A-P Bar may also be used to anchor the field sheet at the base of vertical angle changes.

S. Membrane Fasteners and Discs - Mule-Hide offers a variety of membrane fasteners and discs to meet specific job conditions and substrates.

T. Mule-Hide Thermoplastic Pourable Sealant - a one-component thermoplastic sealant for use in pitch pockets.

TPO ROOFING SYSTEM FULLY ADHERED

075400- 6

U. Mule-Hide TPO .045 Reinforced 6" X 100' – used for stripping-in TPO Coated Metal and as cover strips over TPO Coated Metal joints.

V. Mule-Hide TPO Cut Edge Sealant – A solvent-based liquid sealant used to seal the cut edge of the Mule-Hide TPO Membrane.

W. Mule-Hide TPO Walkway Rolls – a 1/8-inch thick embossed TPO membrane available in rolls (34" x 50') having a herringbone traction surface. Walkway Rolls are trimmed in safety yellow along the length of the sheet to better define the walkway area. Walkway Rolls may be welded directly to the TPO roofing membrane. The yellow edges are smooth without safety lugs to allow for easier welding. Walkway Rolls are available in White and Gray colors.

X. Mule-Hide Insulation - Mule-Hide Poly ISO 1 and Poly ISO 2 polyisocyanurate insulation (flat or tapered) is a closed-cell polyisocyanurate foam core laminated to heavy, black (non-asphaltic) glass fiber reinforced felt facers.

Y. Mule-Hide HP Protective Mat - A nominal 6.0-ounce per square yard (140 grams per square meter) UV resistant polypropylene needle punched fabric. It can be used above the membrane as a slipsheet for protection from damage by materials placed on top of the membrane.

X. F5 Air & Vapor Retarder - A 40-mil thick composite consisting of 35-mil self-adhering rubberized asphalt membrane laminated to a 5-mil UV resistant poly film with an anti-skid surface which is fully compatible with Helix Max Adhesive. A white poly film is available for summer time exposure and a black poly film is available for winter time exposure. F5 Air & Vapor Retarder can also function as a temporary roof for up to 120 days. Available in rolls 39" wide by 75' long (244 square feet).

2.4 RELATED MATERIALS BY OTHERS

A. Wood Nailers

1. Nailers shall be #2 or better lumber. Creosote and asphaltic preservatives are not acceptable. Pressure treated lumber is required.

2. Wood nailers shall conform to Factory Mutual's Loss Prevention Data Sheet 1-49.

3. Wood nailers shall be installed as specified on the project drawings and shall be of a height sufficient to match the thickness of the insulation being used.

B. Insulation

1. Insulation shall be installed as a protection layer over the existing substrate or to obtain a desired thermal value.

2. Insulation shall be compatible with the roofing system manufacturer's membranes, adhesives, and TPO flashings and other accessories.

3. The following insulation boards are acceptable for use with a fully adhered roofing system when a standard warranty is requested:

a. Polyisocyanurate insulations having non-asphaltic facers (foil facers are not acceptable) meeting the physical property requirements of Fed. Spec HH-I-1972 and having a minimum compressive resistance of 20 psi. Thickness minimum is 1.0" or greater as required by insulation manufacturer to span steel deck flutes.

b. Poly ISO 1-HD is ½" thick, 109 psi high density polyisocyanurate insulation board that was specifically designed for use as a cover board. This product consists of a closed-cell polyisocyanurate foam core laminated to premium performance coated glass fiber felt facers.

c. High Density Wood Fiberboard - may be used as an overlay over other insulations. Thickness per the Drawings. Mule-Hide requires a minimum 1-inch thick board when installing directly over steel decks. Wood and concrete decks require a minimum 1/2-inch thick board. Minimum thicknesses and attachment rates will vary with wind requirements and deck types.

d. Expanded Polystyrene. Density of boards must be 1.0 PCF certified minimum and meeting ASTM C578, Type II physical properties. Minimum thickness shall be 1.0 inch. When installing directly over a steel deck the minimum thickness shall be as required by insulation manufacturer to span flutes. An overlay of a minimum 1/2" thick HD Wood Fiberboard, minimum 1" polyisocyanurate insulation, minimum ¼" DensDeck, or minimum ¼" Securock is required. Check local building codes as a layer of gypsum board may be required under the EPS insulation (on steel decks).

e. Extruded polystyrene meeting ASTM C578, Types IV, VI or VII physical properties. Minimum thickness shall be 1.0 inch. When installing directly over a steel deck the minimum thickness shall be as required by insulation manufacturer to span flutes. An overlay of a minimum 1/2" thick HD Wood Fiberboard, minimum 1" polyisocyanurate insulation, minimum ¼" DensDeck, or minimum ¼" Securock is required. Check local building codes as a layer of gypsum board may be required under the extruded insulation (on steel decks).

f. Perlite Insulation – Perlite is **not** an acceptable top layer insulation. Perlite may only be used as a fill insulation under an approved insulation. The TPO membrane cannot be adhered directly to perlite insulation.

g. Dens Deck Prime or Securock - A minimum 1/4" thick layer of Dens Deck Prime or Securock may be used as an overlay over an approved insulation or as a thermal barrier over a combustible deck.

h. State and local building codes should be reviewed regarding the installation of expanded or extruded polystyrene insulation directly over a steel deck.

4. Insulation manufacturer shall provide its recommendations for use and attachment to the owner with a copy sent to roofing manufacturer. In addition, the insulation manufacturer shall provide a copy of their specific warranty conditions.

5. Mule-Hide Premium Warranties require the use of the Mule-Hide labeled insulation or insulation by an approved Mule-Hide manufacturer. Use of other insulations may disqualify the project for consideration of the issuance of a Premium warranty. Contact the Mule-Hide Technical Department for specific requirements.

C. Sheet Metal

1. TPO Coated Metal and non-coated metal components such as gravel stops, drip aprons, counterflashings, copings, etc., should be fabricated and installed in accordance ES-1 recommendations and requirements.

2. Sheet metal components supplied by others may not be covered by the roofing system manufacturer's warranties. Contact manufacturer for specific requirements.

2.5 PRECAUTIONS

A. Consult Safety Data Sheets and container labels for specific safety instructions prior to use.

B. Avoid breathing vapors of solvents, cleaners, primers, sealants and adhesives. Use with

TPO ROOFING SYSTEM FULLY ADHERED

075400- 8

adequate ventilation. Avoid prolonged contact of solvents, sealants, cleaners, primers and adhesives with skin. Solvent resistant rubber gloves should always be worn during use.

C. Do not use TPO roofing products near fire or flame. Do not use open flames for drying of surfaces, sealants or adhesives. **Do not smoke near flammable products.**

D. Do not use oil-based paint on TPO Coated Metal or membrane. Contact manufacturer's Technical Department for recommendations.

E. Do not allow muriatic acid (masonry cleaner) to come in direct contact with the TPO Membrane or accessory products.

F. Do not allow TPO membranes or accessories to come into direct contact with steam or vents that produce temperatures in excess of 160°F (71°C).

G. The TPO Roof System may be installed in cold weather provided the adhesives are stored at room temperature until just prior to use and used within 2 hours. Adhesives left in the cold must be returned to room temperature prior to use.

H. Cover Tapes may lose tack when exposed to temperatures below 40° F. for extended periods of time. A heat gun may be used to warm the product. Only apply heat to the TPO side. Be careful not to overheat. Hot boxes are the preferred method to warm tapes.

I. In colder temperatures when the ambient temperature is near the dew point, condensation may form on the tape primer and adhesive as the solvents flash off. If condensation occurs, discontinue the application and allow the surface to dry. **Do not attempt to dry the surface with heat guns or torches.** When weather permits apply a new coat of product.

PART 3 - EXECUTION

3.1 GENERAL

A. When installing a Fully Adhered Reinforced TPO Membrane Roofing System in cooler weather, it is recommended that liquids such as solvents, sealants, etc. be stored at warmer temperatures (60°F or more but not exceeding 80°F) until just prior to use in order to facilitate the installation.

B. When using Aqua Base 120, the adhesive must be installed in temperatures of 40°F and rising for 48 consecutive hours to prevent the Aqua Base 120 from freezing before it fully cures.

C. Application of the Helix Max Low-Rise Adhesive shall not proceed during periods of inclement weather. Follow manufacturer's requirements for application temperatures and humidity levels.

D. Do not apply Helix Max Low-Rise Adhesive when surface and/or ambient temperatures are below 25°F.

3.2 SUBSTRATE CONDITIONS

The following general conditions apply to the substrate that will receive a Fully Adhered TPO Membrane Roofing System for both new construction and reroof applications:

A. The roof deck must be structurally sound to provide proper securement for mechanical fasteners. Areas showing a loss of integrity due to corrosion, rotting, warping, concrete spalling, etc., must be repaired or replaced prior to installing the roofing system.

B. It is the responsibility of the roofing contractor to perform test cuts at each roof area prior to

reroofing. The condition of the substrate must be suitable to receive a Fully Adhered TPO Roofing System. Wet insulation must be removed and replaced. See Single-Ply Roofing Institute's guidelines for determining wet insulation.

C. Contact the material manufacturer when the substrate is exposed to excessively high humidity and/or a corrosive environment. Special fasteners (i.e. - stainless steel) or details may be required.

D. A determination must be made regarding the presence or absence of coal tar pitch within the existing roof assembly when considering a recover of the old roof system. The presence of coal tar pitch requires the use of a 6-mil poly slipsheet under the new insulation unless the coal tar pitch is 10 years or older and is separated from the TPO membrane by a layer of insulation a minimum of 1-1/2" thick having a minimum "R" value of 5.0. All joints must be butted tightly together or have joints completely taped to prevent volatiles from damaging roof membrane.

E. It is acceptable to install a Fully Adhered TPO Membrane Roofing System over the following deck substrates provided that an acceptable insulation is installed over the substrate as needed:

1. Structural Metal Deck (22 gauge minimum) shall conform to recommendations outlined in Factory Mutual's Loss Prevention Data Sheet 1-28 (requires insulation). Contact Warranty Department for attachment requirements for decks less than 22-gauge in thickness. All FM testing is based on attachment to a 22-gauge steel deck.

2. Structural concrete and pre-cast, pre-stressed concrete (2,500 psi. minimum) shall be cured and dry to industry standards and surface shall be smooth and free of moisture or frost. All sharp ridges or other projections above the surface shall be removed before roofing. An approved insulation board is recommended. Minimum deck thickness shall be 2 inches with 3 inches preferred due to possible spalling damage that may occur to the underside of the deck when using fasteners for insulation and membrane attachment. Insulation may be attached with Type III or IV hot asphalt, approved adhesive or approved fasteners. The membrane may be adhered directly to structural concrete decks that have been trowel finished and are completely cured (28 day minimum). Gaps in the deck along the perimeter and around penetrations must be sealed along with vertical joints between tilt-up panels, if present, to prevent infiltration of hot humid air and possible moisture contamination resulting from condensation.

3. Lightweight Insulating Concrete Fill and Metal Form work (minimum 24 gauge metal form work) - the roof deck shall be cured and dry to the deck manufacturer's and/or industry standards and shall be smooth and free of ridges and depressions. All necessary venting as recommended by the roof deck manufacturer shall be accomplished. These decks may be acceptable to receive a Fully Adhered TPO Membrane Roofing System after pullout tests have been completed and appropriate fasteners have been selected. Attachment must be through the insulating concrete into the steel or concrete deck. Insulation board is required. Vapor barriers may be required when installing insulation over new decks.

4. Wood Plank (1" minimum) shall conform to Factory Mutual's requirements for Class 1 impregnated decks (insulation is required). FM approved wood decks are a minimum, nominal 2-inch thick, tongue and groove planks.

5. Plywood (15/32" minimum) shall be exterior grade (minimum CDX grade). A layer of an approved insulation is required for reroof applications. On new construction, while insulation board is recommended, adhering directly to the plywood or Oriented Strand Board ("OSB") deck is acceptable if the decking is secured with screws or back-out resistant fasteners. Decks attached with common or cement coated nails or staples shall be covered with an approved insulation. Check with local building code requirements as adhering a TPO membrane direct to a wood deck may not meet local fire codes.

6. Cementitious Wood Fiber Decks - Certain cementitious wood fiber decks may be acceptable to

receive a Fully Adhered TPO Membrane Roofing System after pullout tests have been completed and appropriate fasteners have been selected. This deck type requires an acceptable insulation.

7. Gypsum Deck - shall be cured and dry to manufacturers' and/or industry standards. The surface of the deck shall be smooth and free from ridges and depressions. Certain gypsum concrete decks may be acceptable to receive a Fully Adhered TPO Membrane Roofing System after pullout tests have been completed and appropriate attachment methods have been selected. This deck type typically requires an acceptable insulation.

8. Oriented Strand Board (OSB) shall be a minimum 7/16" thick. Contact manufacturer for acceptable sheet sizes, fastener types and spacing when using OSB as requirements will change with thickness used. Minimum thickness or usage restrictions may change depending on local code requirements. Pullout tests must be performed and submitted to Mule-Hide Technical Department prior to bidding the project.

Helix Max Substrate Compatibility					
Insulation/Underlayme		Roof Decks		Existing Roofing	
Poly ISO 1 & 2		Concrete		Smooth BUR	
StructoDeck® High		Cellular Lt.Wt.		Gravel BUR	
Expanded		NVS Lt.Wt.		Mineral Cap	
Extruded		Gypsum		Granular	
New Sprayed		Cementitious		Smooth	
Scarified SPF		Plywood/OSB		Coal Tar Pitch	
DensDeck®		Painted Steel		Aluminum-	
Securock®		Galvanized		Acrylic-Coated	
Oriented Strand		Acoustical Steel		Silicone-Coated	
Poly ISO 1HD		Wood Plank		Unoxidized	

- Standard TPO (Non Fleece Back) membrane cannot be installed directly over EPS and requires a suitable overlayment or cover board.
- For insulation attachment only, contact Mule-Hide Technical Department for options.
- For new galvanized steel decks, power-washing is necessary to remove finishing oil residue if present.
- For acoustical steel decks, fill the flutes with fiberglass or other suitable fill insulation and tack in place with strips of duct tape 3' OC, or other adhesive, prior to spraying the deck with Helix Max Adhesive.
- A minimum of an approved cover board or insulation is required over properly prepared gravel BUR.
- An insulation providing the necessary R-value must be specified to prevent the coal tar pitch from softening.
- Aluminum coatings must be removed by power-washing or by physical abrasion prior to the application of Helix Max Adhesive. Adhesion tests are required to confirm sufficient preparation of the substrate.
- SPF roofing assemblies may be considered on a job by job basis, contact Mule Hide Technical Department prior to bidding.
- Contact manufacturer for specific requirements on recover applications over Aged Hypalon, or Aged (min 5-years) TPO membrane.
- Requires AeroWeb for all applications.
- Cellular or air-entrained lightweight substrates are acceptable. Lightweight concrete containing expanded aggregate such as perlite or vermiculite is not acceptable. New lightweight concrete must be confirmed by the contractor to be thoroughly dry. Existing substrates will require adhesion tests.

F. For reroofing projects having plywood decks, a minimum of one layer of an approved insulation is required after the tear-off has been completed.

G. All roof surfaces shall have a positive slope to provide adequate drainage. There should not be any ponding water 48 hours after a rainfall.

3.3 PREPARATION OF EXISTING SUBSTRATE

A. General

1. To prevent delays or interruptions, coordinate work with other trades or suppliers to ensure that components to be incorporated into the Fully Adhered TPO Membrane Roofing System are available as the work progresses. Examine substrates to which the roofing materials are to be applied to ensure that their condition is satisfactory for the TPO Membrane Roofing System application.

2. Do not permit voids greater than 1/4" wide in the substrate. Concrete substrates shall be cured and free of laitance and curing compounds. Substrates for roofing materials shall be dry and free of oil, dirt, grease, sharp edges and debris. Inspect substrates and correct defects before application of roofing membrane.

3. Specifier or roofing contractor shall determine the condition of the existing roof deck and roofing system. Areas with deteriorated decking, wet insulation or other failed materials shall have those affected materials removed and replaced. Make sure all decking is securely fastened. The roofing contractor has the final responsibility to ensure an acceptable deck is provided to receive the new roof system.

4. Large blisters shall be cut and patched to provide a reasonably level surface.

5. On recover projects, tear off all existing base flashings, cant strips and projection flashings down to the substrate. The flashing substrate shall be dry and free of oil, dirt, grease, sharp edges and debris.

6. Gravel over existing nailers must be totally removed prior to installing new nailers and flashings. Verify that the existing nailers are in good condition and securely anchored to the roof decks.

7. When an additional thickness of insulation is being added, new nailers must be added over existing nailers to match the height of the new insulation. Nailers must be securely anchored to the roof deck per Section 3.05 of this specification.

8. All roof surfaces shall be free of ponded water, ice, or snow. Significant ponding that remains after a period of 48 hours should be eliminated by either installing tapered insulation to create positive drainage of the roof surface or by installing new drains in the low areas where the ponding remains. Positive drainage shall also eliminate the possibility of excessive live loads caused by ponding water that could cause structural damage or failure.

9. When removing an existing roof during reroofing, remove only that amount of roofing and flashing that can be made watertight with new TPO materials in a one-day period or prior to the onset of inclement weather.

10. Recovering over a gravel surfaced BUR system requires the installation of an acceptable insulation. Loose gravel must be removed prior to mechanically attaching a new layer of insulation. All lead pipe and drain flashings shall be removed.

11. Recovering over a smooth surfaced BUR and smooth Modified Bitumen roofing systems shall require the installation of an acceptable insulation. All lead pipe and drain flashings shall be removed. Single-ply membranes such as EPDM, Hypalon, PVC or CPA must have all existing

flashings removed, the field sheet must be cut up into sections no larger than 10' by 10' and an acceptable layer of insulation shall be mechanically attached over the existing field membrane.

12. Polyurethane Foam roofing systems ("PUF") are not acceptable for recover applications. The PUF system must be completely removed and new insulation installed prior to the installation of the new TPO Roofing System.

13. If a Mule-Hide Premium System Warranty is requested, the existing roof system **must be removed to the deck** prior to the installation of the new roofing system or a moisture survey by an independent third party must be taken, all wet areas removed and a copy of the survey submitted to Mule-Hide with the warranty application. In no event shall the Mule-Hide Premium System warranty cover the existing roof system or problems created by the existing roof system.

3.4 VAPOR RETARDER INSTALLATION (WHERE SPECIFIED)

A. Specific climatic and job conditions may require the use of a vapor retarder. It is the sole responsibility of the design professional to determine the need for a vapor retarder (which may be required by local building or energy codes) and its type and location in the roofing system. A vapor retarder may often act as an "air barrier" which may have a positive effect in reducing internal air pressure. Vapor retarders should be strongly considered for buildings subject to high internal air pressures such as airplane hangars and buildings with many loading bays such as warehouse facilities.

B. The National Roofing Contractors Association recommends the installation of vapor retarders when interior relative humidity is 45% or greater and the outside mean average January temperature is below 40° F.

C. Install a vapor retarder over a suitable substrate with all side and end laps and all penetrations sealed in accordance with the manufacturer's instructions. The vapor retarder may be loosely laid or adhered with the manufacturer's recommended adhesive.

D. In reroofing where the existing built-up roof is to remain, the built-up roof may be an adequate vapor retarder as long as all splits or tears are repaired in order to provide a total barrier to vapor penetration.

3.5 WOOD NAILERS

A. Wood nailers are required at all roof perimeter edges where metal edging and gutter systems are specified or where indicated in manufacturer's published Standard TPO Details.

B. Nailers shall be firmly anchored to the decks at a maximum 2'-0" OC and shall resist a pullout force of 200 lbs./linear foot in any direction. A 1/2" vent space shall be provided between adjacent lengths of nailers. Fasteners shall be installed within 6 inches of each end. Spacing and fastener embedment shall conform to Factory Mutual Loss Prevention Data Sheet 1-49.

C. Height of nailers shall match the surface level of the insulation and roof membrane. The width of the wood nailer shall extend beyond the metal flange to prevent damage to the membrane.

D. All woodwork to be reused shall resist a minimum force of 200 lbs/linear foot in any direction and shall be free of rot.

E. Wood nailers with creosote and asphaltic preservatives are not acceptable. Pressure treated lumber is not required on new construction unless specified by the architect.

3.6 INSULATION INSTALLATION

A. General

1. Manufacturer's accepted roof insulations shall be installed in accordance with manufacturers specifications.
2. Roof insulations shall be secured to the roof deck in accordance with manuf. requirements.
3. All roof insulation shall be neatly cut to fit around all penetrations and projections with a maximum allowable gap of 1/4-inch.
4. Open joints shall be repaired with like insulation material.
5. Insulation shall be feathered or tapered to provide a minimum sump area of 36" x 36" where possible at all drains. Crickets and saddles may be installed beneath the specified insulation where possible. Crickets and saddles made from non-compatible insulations materials must be overlaid with an acceptable insulation or underlayment.
6. Install no more roof insulation in one day than can be covered with the TPO Membrane or when the onset of inclement weather is anticipated.
7. Insulation installed over steel decks shall be checked so that no edges are left unsupported along the flutes. All insulations shall be of sufficient thickness and density to prevent breakage under normal roof construction traffic.
8. When installing insulation, the end joints of each row of insulation shall be offset against the previous row. When more than one layer of insulation is to be used, succeeding layers are to be laid staggered in relation to the previous layer of insulation and all joints shall be offset.
9. Insulation other than manufacturer's labeled insulation must be an FM approved insulation and approved by manufacturer for use under the Fully Adhered TPO Roofing System. Refer to the insulation manufacturers guidelines for the appropriate type, size and thickness of the insulation needed for use over the respective substrate and under the TPO Roofing System. Contact manufacturer's technical department prior to bidding the project to determine approved insulations and assemblies.

B. Adhesive Attachment

Adhesive attachment substrate preparation

1. The surface to which adhesive is to be applied shall be dry, clean and free of fins, protrusions, sharp edges, loose and foreign materials, oil and grease. Depressions greater than 1/4" (6 mm) shall be filled with Helix Max Adhesive or other approved patching material. All sharp projections shall be removed. Previously unoxidized (shiny) asphalt must be primed with AeroWeb.
2. Apply Helix Max Adhesive when the substrate and ambient temperatures are 25°F (-4°C) or above when spraying or extruding with heated or non-heated equipment. Dispense the adhesive between 300-800 psi depending on the equipment used.

Adhesive installation

1. Apply Helix Max Adhesive to the substrate.
 - a. For fully adhered applications, spray adhesive to obtain full coverage (approx. 1/8" to 1/4" thick after foaming).
 - b. For bead applications, apply adhesive at 4", 6", or 12" on center with a **minimum 1/2" wide wet**

bead. For steel decks, bead attachment of Helix Max Adhesive must run parallel with and be on top of the steel deck flutes.

Bead Spacing Requirements*				
Building Height	Perimeter Width	Bead Spacing		
		Field	Perimeter	Corner
0-25'	4 Feet	12" OC	6" OC	6" OC
26'-49'	8 Feet	12" OC	6" OC	6" OC
50'-74'	12 Feet	12" OC	6" OC	6" OC
75'-100'	16 Feet	12" OC	6" OC	6" OC
101' or greater	Contact Mule-Hide Technical Department			

*Spacing parameters are for 10, or 15-year 55-mph warranties: (Contact the Mule-Hide Technical Department for bead spacing on higher mph warranties or 20 and 30-year warranty projects).

2. Factory Mutual bead spacing guidelines in the perimeter and corner may differ from the table above. Beads at 12" OC are not acceptable at perimeters and corners.
3. Allow adhesive to rise and develop "string/body" (approx. 1-1/2 - 2 min.). String time will vary based on environmental conditions like temperature and humidity. Do not allow the adhesive to over-cure (lose tack) prior to setting insulation boards.
4. Place insulation boards (maximum 4' x 4'. Cover boards such as DensDeck Prime or Securock may be 4' x 8') into adhesive after allowing it to rise and develop "string/body".
5. Designate one person to walk boards into place and then roll the boards between 5-7 minutes from the initial adhesive application. Boards may be temporarily weighted or relief-cut where necessary to keep the boards in constant contact with the adhesive until the adhesive cures.
6. At the beginning of the insulation attachment process and periodically throughout the day, check the adhesion of boards to ensure a tight bond is created and maximum contact is achieved.

CAUTION: Gaps between horizontal and vertical surfaces of the roof area as well as gaps around penetrations must be sealed to prevent interior warm air from infiltrating and condensing within the roofing assembly. Condensing moisture could weaken bottom insulation facer and eventually result in dislodgement or loose boards when adhesive is used.

3.7 MEMBRANE INSTALLATION

General – Unroll the TPO Membrane and position without stretching. Allow the membrane to relax at least 15 minutes when the temperature is above 60°F, or 30 minutes when the temperature is below 60°F, prior to installation. Inspect and remove any damaged membrane.

- A. Membrane should run perpendicular to the direction of steel deck flutes and orientation of wood decks where possible.
- B. All membrane overlaps shall be installed to facilitate the flow of water. Seams shall be shingled or run parallel to the flow of water. Backwater seams are not permitted.

C. Lap sheets a minimum of 3 inches to provide space for a continuous, minimum 1-1/2" weld. Membrane overlaps shall be shingled with the flow of water or parallel to the flow of water. All welded field seams shall be a minimum of 2 inches wide. End laps shall be overlapped a minimum of 3 inches.

D. The roofing contractor shall check all welded seams for continuity and integrity using a cotter pin puller or other suitable blunt object. The contractor shall make sample test seams each day prior to welding field seams. The contractor shall, using scrap material, run at least two test seams, each a minimum of 2' long. Each test seam shall be used to determine adequate seam strength and to ensure the equipment has warmed up, is operating properly and proper settings have been determined. This should be done each time the equipment is turned on after a cool down period.

E. Perimeter - When installing the Fully Adhered TPO Roofing membrane system, it is not necessary to install Half Sheets parallel with the perimeter. Full size sheets should be used everywhere practical to minimize the number of field seams. In place of Half Sheets, additional fasteners are installed in the insulation in the perimeter areas as defined in 3.06.B Perimeter Enhancements. Weld all laps (seams and end laps) continuously with a minimum weld width of 2 inches. All field welds shall be completed with an automatic welder. Perimeter areas shall be determined by one of the following methods:

1. Mule-Hide Technical Bulletin TPO-FA01-2006, Standard Fastening Patterns and Guidelines. Mule-Hide defines the minimum perimeter area as 8' in from the roof edge along all exterior roof edges.
2. For Factory Mutual insured buildings, follow guidelines in FM's Loss Prevention Data Sheet 1-29. Contact Mule-Hide Warranty Department for fastener spacing for compliance with FM 1-60 and 1-90 requirements.

3.8 FIELD SHEET ATTACHMENT

A. Adhesive Options for TPO Adhered Systems

Adhesive*	Single Sided (Wet Lay)	Double Sided (Contact)
TPO Bonding Adhesive	No	Yes
Low-VOC Bonding Adhesive	No	Yes
Low-VOC 1168 Bonding Adhesive	No	Yes
Aqua Base 120	No	Yes
AeroWeb Low-VOC Aerosol Contact Adhesive	No	Yes
*Refer to Product Data Sheets for specific installation instructions related to each adhesive option.		

A. General

1. Position

membrane over substrate with minimum 3" overlap at lap seams, and positioned so that laps will shed water. Allow the membrane to relax at least 15 minutes prior to fastening when temperatures are 60° F and above or 30 minutes when temperatures are below 60° F. After membrane has relaxed, fold membrane in half lengthwise exposing the underside of the sheet. Pails of adhesive are often used to weight the back edge of the membrane to hold it in position. **CAUTION:** Keep the protective packaging of the Heat-Weld Membrane intact until ready to use.

B. TPO Bonding Adhesive, Low VOC Bonding Adhesive, Low VOC Bonding Adhesive - 1168

(solvent base), and Aqua Base 120 Bonding Adhesive

1. Mix adhesive scraping the sides and bottom of the can (minimum of 5 minutes is required) until adhesive is uniform in color. Consult Product Data Sheet for adhesive instructions.
 - a. Low VOC Bonding Adhesive and Low VOC Bonding Adhesive – 1168 require mechanical stirring (electric drill), both initially and periodically during application.
2. Using a plastic core, medium nap roller, apply a smooth even coat of TPO Bonding Adhesive to back side of membrane and substrate (no globs or puddles). A nine inch roller will easily fit into a 5-gallon adhesive container. **Do not apply adhesive in area of seam laps.**
3. Coverage rates for TPO Bonding Adhesive, Low VOC Bonding Adhesive, and 1168 are approximately:
120 square feet per gallon for one surface (membrane or substrate only) or
60 square feet per gallon per finished surface (membrane & substrate)
3. Coverage rate for Aqua Base 120 is approximately:
100-120 square feet per gallon per finished surface (membrane & substrate)
5. Allow adhesive to dry to a 'tacky' state. Test adhesive by placing a knuckle into it and turning your wrist a one-quarter turn. Adhesive is ready to mate when it is tacky but does not string when knuckle is lifted (Aqua base 120 will take a longer time to dry).
6. Care must be taken to ensure proper drying. Avoid thin areas of adhesive which can result in over drying and improper adhesion.
7. Roll coated membrane onto substrate being careful to not wrinkle the sheet or trap air bubbles. Once membrane is mated to the substrate, thoroughly broom into place with a stiff bristled push broom to ensure proper contact and 100% adhesion. Repeat this procedure for remaining sheets.

C. AeroWeb

1. Connect spray gun to hose and connect hose to cylinder. Use lithium grease or petroleum jelly on all fittings and be careful to avoid cross-threading. Open valve on cylinder to check fittings for leaks. Keep cylinder valve open to maintain pressure in the hose/spray gun when not in use.
2. AeroWeb can be applied at ambient temperature of 25°F and above. Propellant in cylinders must be kept above 70°F for the product to spray properly. Utilize power-heated blanket, and hot boxes when necessary. Substrate shall be clean, dry, and free of debris and contaminants.
3. Application shall be continuous and uniform, avoiding globs or puddles.
4. Spray substrate and back of the membrane with enough overlap to ensure 100% coverage (2"-3" of overlap).
5. Do not apply adhesive to splice areas.
6. Roll coated membrane onto substrate being careful to not wrinkle the sheet or trap air bubbles. Once membrane is mated to the substrate, thoroughly broom into place with a stiff bristled push broom to ensure proper contact and 100% adhesion. Repeat this procedure for remaining sheets.

D. Extended drying times can be expected during cool, overcast, humid, shaded, or late day applications. The adhesive must be dry (but still tacky) before mating surfaces to avoid permanent blisters due to trapped moisture. Repeat this procedure for the second half of the sheet and each

TPO ROOFING SYSTEM FULLY ADHERED

successive sheet of membrane on the roof, remembering to shingle all laps.

E. Do not run any seams through field drains or sumps. Any seams running through drains shall be cut out and target patches (36" x 36") shall be installed.

3.9 WELDING OF LAP AREAS

A. General

1. Roofing membrane is to be hot air welded only. Seaming of "membrane to membrane" and "flashing/detail membrane to membrane" shall be by hot air welding only.

2. All surfaces to be welded shall be clean and dry.

B. Hot Air Welding

1. Machines for hot air welding are available from several different sources. Each manufacturer's instructions for use shall be followed, as well as all local codes regarding electric grounding, supply and other related functions. Since most automatic welding machines require 218 to 230 volts, the use of a portable generator on the roof is recommended for greater flexibility. Use of automatic welding machines for all field sheet seaming is required. Hand welding is only acceptable for flashings and those seams where the automatic welder cannot be used.

2. Hand-held welding equipment is also available to weld membrane. After the preheated nozzle tip is applied in the overlap area and the material starts to soften, immediately follow with a silicone hand roller to press the heated membrane surfaces together with slow, even movements. Keep the roller within 1 inch of the nozzle tip. Angle the hot air tool so that the flowing air faces the roller. Seam strength may be tested when cool. For best results, testing seams 8 hours after hot air welding is recommended.

C. Seam Patches at Roof/Wall Transitions

1. Install Non-Reinforced TPO Flashing Membrane patches over any seam that transitions from the horizontal to the vertical. These patches are to be constructed with Non-Reinforced TPO Flashing Membrane only and hot air welded.

D. Daily Welding Equipment Setup

1. The roofing contractor shall make sample test seams each day prior to welding field seams. The contractor shall, using scrap material, run at least two test seams, each a minimum of 2 feet long. Each test seam shall be used to determine adequate seam strength and to ensure the equipment has warmed up, is operating properly and proper settings have been determined. This should be done each time the equipment is turned on after a cool down period.

E. Quality Control of Seams

1. After seaming, the seams are checked for integrity with a probe. Any openings or "fishmouths" are to be repaired with a hand-held hot air tool fitted with a narrow nozzle tip and with a roller. Each day the contractor shall attempt to pull apart several sections of welded seams to test the quality of the welds. Should the welds be deficient, a more thorough examination of the work performed must be carried out and necessary repairs made.

3.10 ADDITIONAL MEMBRANE SECUREMENT (BASE ATTACHMENT)

A. Additional securement of the TPO membrane by mechanical attachment must be provided at the

perimeter of each roof level, base of walls, curbs, skylights, expansion joints, tie-ins, interior walls, bottom of valleys and any angle changes that exceed inclines of 2:12 (2" rise in 12") and various penetrations as shown in the Mule-Hide Standard Details. All securement must be either horizontally to the roof deck or vertically to the base of the various penetrations as shown in the Mule-Hide Standard Details.

B. The mechanical attachment of the membrane may be achieved by the following methods:

1. 2.4" Seam Plate and appropriate fasteners through the membrane

a. The 2.4" Seam Plate and appropriate fasteners are placed with the edge of the Seam Plate approximately ½" away from the angle change. Seam Plates may be placed either horizontally or vertically depending on the conditions encountered. Refer to the Mule-Hide TPO Standard Details for proper placement.

2. All Purpose Bar

a. The All Purpose Bar is a specially extruded aluminum bar that has pre-punched holes 6 inches on center. Bar may be placed either horizontally or vertically depending on the detail followed. Refer to the manufacturer's TPO Standard Details for the proper placement.

b. The maximum spacing of the fasteners shall not exceed 12 inches on center. Adjoining bars should be spaced approximately ½ inch to 1 inch apart. All bars must be attached at the ends a maximum of 1 inch from the end of each bar. This may require pre-drilling additional holes. All cut bars shall be deburred.

c. Under no circumstances shall the All Purpose Bar be stripped-in with TPO PS Cover Strip. TPO .045 Reinforced 6" X 100' product may be used to strip-in the All Purpose Bar with a continuous, minimum of 1-1/2" (40 mm) wide weld.

d. The All Purpose Bar must be installed a minimum of 3 inches to a maximum of 6 inches from inside and outside corners.

3. TPO PS RUSS attachment strip

a. The RUSS is a 6" wide reinforced strip of TPO membrane that may be installed at the base of walls and curbs. Mule-Hide 2.4 inch Seam Plates are used to attach the RUSS horizontally with appropriate fasteners. Refer to Mule-Hide Detail # MHT-UN-305B for appropriate placement of the RUSS, plates and fasteners. The RUSS attachment strip is installed prior to the placement of the field sheet. The RUSS attachment strip is to be placed on horizontal surfaces only and not turned up the vertical.

b. Follow the standard procedures for cleaning, applying primer and adhering the RUSS and field sheet. Only Mule-Hide TPO Primer or Low VOC Primer may be used to adhere the RUSS to the field sheet. Bonding Adhesive is **not permitted** for use with the RUSS attachment strips.

c. Spacing of the fasteners shall not exceed 12 inches on center. Adjoining RUSS attachment strips shall be spaced a maximum of 1 inch apart. It is not required to overlap the RUSS.

d. For horizontal attachment, the RUSS attachment strip must be placed a maximum of ½ inch from the base of the angle change extending out onto the horizontal surface (roof substrate). The 2.4 inch Seam Plate must be placed a minimum of ½ inch to a maximum of 1 inch from the exterior edge of the strip. Refer to Mule-Hide Detail # MHT-UN-305B. Installation of the plates must be a minimum of 6 inches to a maximum of 9 inches from the inside and outside corners.

4. Drip Apron and Gravel Stop

TPO ROOFING SYSTEM FULLY ADHERED

- a. For drip aprons and gravel stops, the metal flange shall extend a minimum of 3 inches onto the wood nailer. The wood nailer must be wider than the metal flange. Approved screw fasteners shall be installed a maximum of 6 inches on center and 1/2" to 3/4" from the inside edge of the metal flange. Ring shank nails spaced a maximum of 4" on center may also be used.
- b. Drip aprons and gravel stops not made out of TPO Coated Metal shall be primed with TPO Primer or Low VOC Primer and stripped with TPO PS Cover Strip. Cleaning the metal with a solvent such as toluene or xylene to remove oil film may be required prior to installing and priming with the TPO Primer.

3.11 FLASHING INSTALLATION

A. TPO Membrane Flashings

1. All membrane flashings are to be installed concurrently with the roof membrane as the project progresses. Temporary flashings are not allowed without prior written approval from the manufacturer. Should any water penetrate the new roofing because of incomplete flashings, the affected areas shall be removed and replaced at the contractor's expense.
2. All surfaces to be fully adhered should be compatible, dry and smooth with no excessive surface roughness.
3. On recover projects, tear off all existing base flashings, cant strips and projection flashings down to the substrate. If deteriorated areas of substrate are uncovered, repairs must be made to provide a suitable substrate for the new TPO flashings.

B. Adhesive options for wall flashings (Standard TPO only)

Adhesive*	Single Sided (Wet Lay)	Double Sided (Contact)
TPO Bonding Adhesive	No	Yes
Low-VOC Bonding Adhesive	No	Yes
Low-VOC 1168 Bonding Adhesive	No	Yes
Aqua Base 120	No	Yes
AeroWeb Low-VOC Aerosol Contact Adhesive	No	Yes
*Refer to Product Data Sheets for specific installation instructions related to each adhesive option.		

C. Double Sided Contact Application

- a. Refer to Section 3.08 C for AeroWeb application instructions.
- b. Mix adhesive scraping the sides and bottom of the can (minimum 5 minutes is required) until adhesive is uniform in color. Consult product data sheet for adhesive instructions.
- c. Low VOC Bonding Adhesive and Low VOC Bonding Adhesive – 1168 require mechanical stirring (electric drill), both initially and periodically during application.
- d. Porous surfaces and substrates may require the application of a prime coat and second coat of

TPO ROOFING SYSTEM FULLY ADHERED

Low VOC Bonding Adhesive and Low VOC Bonding Adhesive – 1168 to accomplish proper adhesion.

e. Using a plastic core, medium nap roller, apply a smooth even coat of TPO Bonding Adhesive to back side of membrane and substrate (no globs or puddles). A nine inch roller will easily fit into a 5-gallon adhesive container. **Do not apply adhesive in area of seam laps.**

f. Allow adhesive to dry to a 'tacky' state. Test adhesive by placing a knuckle into it and turning your wrist a one-quarter turn. Adhesive is ready to mate when it is tacky but does not string when knuckle is lifted.

g. Care must be taken to ensure proper drying. Avoid thin layers of adhesive which can result in over drying and improper adhesion.

h. Roll coated membrane onto substrate being careful to not wrinkle the sheet or trap air bubbles. Once membrane is mated to the substrate, carefully roll the membrane with a 2-inch wide rubber hand roller to promote maximum positive contact between the membrane and the substrate.

i. **Areas of the flashings and membrane to be welded are not to have TPO Bonding Adhesive applied to them.**

j. Extended drying times can be expected during cool, overcast, humid, shaded, or late day applications. The adhesive must be dry (but still tacky) before mating surfaces to avoid permanent blisters due to trapped solvents.

k. All flashings shall be extended a minimum of 8 inches above roof membrane level and be terminated unless previously accepted by the owner or his representative and the manufacturer. All flashings shall be hot air welded at their connections with the roofing membrane. Apply Cut Edge Sealant at all welded edges of cut membrane flashings.

1. All flashings shall be hot air welded at their connections with the roofing membrane. All hand welds shall be a minimum of 1-1/2" wide.

2. All flashings shall be properly terminated according to Mule-Hide's published Standard Details.

NOTE: When using All-Purpose Bar under Counterflashing to terminate wall flashing or when coping is used, TPO Bonding Adhesive, Low VOC Bonding Adhesive, Low VOC Bonding Adhesive – 1168, Aqua Base 120 Bonding Adhesive, or AeroWeb may be eliminated when flashing height is 12" - 18" or less, depending on the type of termination. Refer to Mule-Hide's published Standard TPO Details for additional information.

3.12 DRAINS, EXPANSION JOINTS, PITCH PANS

A. Roof Drains

1. Prepare the surface around each drain to prevent any distortion, tenting, or bridging of the membrane. A smooth transition shall be provided from the roof surface to the surface of the drain bowl/clamping ring.

2. All existing roofing materials and metal flashings shall be removed.

3. Mule-Hide requires the application of one full tube of Water Cut-Off Mastic per drain applied to the drain bowl, under the membrane, where the clamping ring will be seated. This will provide a continuous seal between the membrane and the drain bowl.

4. Do not run field seams through drains or sumps. If sheet layout causes a seam to fall in line with a drain, a target patch (minimum 36" x 36") shall be required.

TPO ROOFING SYSTEM FULLY ADHERED

B. Expansion Joints

1. Refer to manufacturer's published Standard TPO Details for application methods for flashing expansion joints.

C. Pitch Pans

1. Install and flash pitch pans as indicated in manufacturer's published Standard TPO Details. All pitch pans shall be filled with Thermoplastic Pourable Sealant.

3.13 WALKWAY INSTALLATION

(no walkways included)

Walkways should be provided in areas where routine rooftop maintenance occurs and in areas where regular rooftop traffic is expected.

A. TPO Walkway Roll Installation

1. Install TPO Walkway Rolls over clean, dry surfaces.
2. Layout areas where TPO Walkway Rolls are to be installed with most of the material being oriented so that it is placed between field seams with each adjacent and abutting section gapped a minimum of 6". Do not install walkway pads over seams.
3. Heat weld the perimeter of the properly positioned TPO Walkway Roll. Check seams for any voids or inconsistencies that might prevent watertightness.

3.14 TEMPORARY TIE-INS

- A. Install temporary cutoffs around incomplete edges of roofing assembly at the end of each day's work and when work must be postponed due to inclement weather. Temporary tie-ins shall be positioned so any sealed membrane edge will not buck or pond water. Ensure drainage is not restricted.
- B. Remove all gravel, dirt, debris or other contaminants from the tie-in area and make sure all surfaces are clean and dry.
- C. All loose membrane edges should be sealed downslope with products compatible with the existing substrate and membrane type being installed. Provide continuous pressure along the sealed edge to prevent water migration under the finished roof sections.
- D. When work resumes, remove the temporary seals completely including contaminated membrane, sealants, insulation fillers, etc. from the work area and properly dispose.

END OF SECTION

SECTION 076200

FLASHING AND SHEET METAL

PART 1 - GENERAL

1.1 DESCRIPTION

- A. Work included: Provide flashing and sheet metal not specifically described in other Sections of these Specifications but required to prevent penetration of water through the exterior shell of the building.
- B. Related work:
 - 1. Documents affecting work of this Section include, but are not necessarily limited to, General Conditions, Supplementary Conditions, and Sections in Division I of these Specifications.
 - 2. Section 07410: Metal Roofing
 - 3. Section 08400: Aluminum Entrances and Storefronts

1.2 QUALITY ASSURANCE

- A. Use adequate numbers of skilled workmen who are thoroughly trained and experienced in the necessary crafts and who are completely familiar with the specified requirements and the methods needed for proper performance of the work of this Section.
- B. In addition to complying with pertinent codes and regulations, comply with pertinent recommendations contained in current edition of "Architectural Sheet Metal Manual" published by the Sheet Metal and Air-conditioning Contractors National Association (SMACNA).
- C. Standard commercial items may be used for flashing, trim, reglets, and similar purposes provided such items meet or exceed the quality standards specified.

1.3 PRODUCT HANDLING

- A. Comply with pertinent provisions of Section 01640.

PART 2 - PRODUCTS

2.1 FLASHING

- A. All exposed metal shall be pre-finished Galvanized Steel Sheet: ASTM A924/A924M, Grade A, of ASTM A653/A653M, G90 zinc coating; 24 gage core steel, shop pre-coated; color as selected by the Architect from the manufacturer's standard line of colors.

2.2 ACCESSORIES

- A. Fasteners: Same material and finish as flashing metal with soft neoprene washers.
- B. Underlayment: No. 30 asphalt saturated roofing felt.

- C. Reglets in masonry: Recessed in sawcut, galvanized.

PART 3 - EXECUTION

3.1 SURFACE CONDITIONS

- A. Examine the areas and conditions under which work of this Section will be performed. Correct conditions detrimental to timely and proper completion of the Work. Do not proceed until unsatisfactory conditions are corrected.

3.2 WORKMANSHIP

- A. General:
 - 1. Form sheet metal accurately and to the dimensions and shapes required, finishing molded and broken surfaces with true, sharp, and straight lines and angles and, where intercepting other members, coping to an accurate fit.
 - 2. Unless otherwise recommended by the manufacturer, turn exposed edges back 1/2".
- B. Form and install sheet metal so as to adequately provide for expansion and contraction in the finished Work.
- C. Weatherproofing:
 - 1. Finish watertight and weathertight where so required.
 - 2. Where lap seams are not soldered, lap according to pitch, but in no case less than 3".
 - 3. Make flat and lap seams in the direction of flow.
- D. Joints:
 - 1. Join parts with flat or lock seams.

3.5 TESTS

- A. Upon request of the Architect, demonstrate by hose or standing water that the flashing and sheet metal are completely watertight.

END OF SECTION

SECTION 079200

SEALANTS AND CAULKING

PART 1 - GENERAL

1.1 DESCRIPTION

- A. Work included: Throughout the Work, seal and caulk joints where shown on the Drawings and elsewhere as required to provide a positive barrier against passage of moisture and passage of air.
- B. Related work:
 - 1. Documents affecting work of this Section include, but are not necessarily limited to, General Conditions, Supplementary Conditions, and Sections in Division I of these Specifications.
 - 2. Section 03300: Cast-in-place Concrete.
 - 3. Section 08100: Metal Doors and Frames.
 - 4. Section 08400: Aluminum Entrances and Storefronts.
 - 5. Section 07600: Flashing and Sheet Metal

1.2 QUALITY ASSURANCE

- A. Use adequate numbers of skilled workmen who are thoroughly trained and experienced in the necessary crafts and who are completely familiar with the specified requirements and the methods needed for proper performance of the work of this Section.

1.3 PRODUCT HANDLING

- A. Comply with pertinent provisions of Section 01640.
- B. Do not retain at the job site material which has exceeded the shelf life recommended by its manufacturer.

PART 2 - PRODUCTS

2.1 SEALANTS

- A. General: Except as specifically otherwise approved by the Architect, use only the types of sealants described in this Article.
- B. Construction and Expansion Joints:
 - 1. Material: One-part polyurethane sealant, complying with ASTM C-920 and Fed. Spec. TT-S-230C (Type 1).
 - 2. Approved Manufacturers: Dow Corning "790" Silicone Building Sealant, equal products of other manufacturers when approved in advance by the Architect.
- C. Exterior joints at window and door frames:
 - 1. Material: One-part silicone sealant, complying with ASTM C-920 and Fed. Spec. TT-S-1543-B.
 - 2. Approved Manufacturers: Dow Corning "791" Silicone Building Sealant, equal products of other manufacturers when approved in advance by the Architect.

D. Miscellaneous:

1. For other services, provide products especially formulated for the proposed use and approved in advance by the Architect.
2. Sealants and caulking utilized in the assembly of pre-engineered metal building components shall be in accordance with the building manufacturer's recommendations subject to the approval of the Architect.

E. Colors:

1. Colors for each sealant installation will be selected by the Architect from standard colors normally available from the specified manufacturers.

2.2 PRIMERS

- A. Use only those primers which are non-staining, have been tested for durability on the surfaces to be sealed, and are specifically recommended for this installation by the manufacturer of the sealant used.

2.3 BACKUP MATERIALS

- A. Use only those backup materials which are specifically recommended for this installation by the manufacturer of the sealant used, which are non-absorbent, and which are non-staining.
- B. Acceptable types include:
1. Closed-cell resilient urethane or polyvinyl-chloride foam;
 2. Closed-cell polyethylene foam;
 3. Closed-cell sponge of vinyl or rubber;
 4. Polychloroprene tubes or beads;
 5. Polyisobutylene extrusions;

2.5 MASKING TAPE

- A. For masking around joints, provide masking tape complying with Fed Spec UU-T-106c.

2.6 OTHER MATERIALS

- A. Provide other materials, not specifically described but required for a complete and proper installation, as selected by the Contractor subject to the approval of the Architect.

PART 3 - EXECUTION

3.1 SURFACE CONDITIONS

- A. Examine the areas and conditions under which work of this Section will be performed. Correct conditions detrimental to timely and proper completion of the Work. Do not proceed until unsatisfactory conditions are corrected.

3.2 PREPARATION

- A. Steel surfaces:
1. Steel surfaces in contact with sealant:
 - a. Clean as required to achieve acceptable surface for bond.

- b. Use solvent to remove oil and grease, wiping the surfaces with clean rags.
 - 2. Remove protective coatings on steel by using a solvent which leaves no residue.
- B. Concrete surfaces:
 - 1. Remove all laitance, oils, dirt, etc. from concrete surfaces to be sealed.
 - 2. Prime surfaces as recommended by the manufacturer of the sealant to be installed.
- C. Aluminum surfaces:
 - 1. Aluminum surfaces in contact with sealant:
 - a. Remove temporary protective coatings, dirt, oil, and grease.
 - b. When masking tape is used for protective cover, remove the tape just prior to applying the sealant.
 - 2. Use only such solvents to remove protective coatings as are recommended for that purpose by the manufacturer of the aluminum work, and which are non-staining.

3.3 INSTALLATION OF BACKUP MATERIAL

- A. Use only the backup material recommended by the manufacturer of the sealant used, and approved by the Architect for the particular installation, compressing the backup material 25% to 50% to achieve a positive and secure fit.
- B. When using backup of tube or rod stock, avoid lengthwise stretching of the material. Do not twist or braid hose or rod backup stock.

3.4 PRIMING

- A. Use only the primer recommended by the manufacturer of the sealant, and approved by the Architect for the particular installation, applying in strict accordance with the manufacturer's recommendations as approved by the Architect.

3.5 INSTALLATION OF SEALANTS

- A. Prior to start of installation in each joint, verify the joint type according to details on the Drawings, or as otherwise directed by the Architect, and verify that the required proportion of width of joint to depth of joint has been secured.
- B. Equipment:
 - 1. Apply sealant under pressure with power-actuated or hand gun, or by other appropriate means.
 - 2. Use guns with nozzle of proper size, and providing sufficient pressure to completely fill the joints as designed.
- C. Thoroughly and completely mask joints where the appearance of sealant on adjacent surfaces would be objectionable.
- D. Tool joints to a slightly concave profile, or as otherwise required if such profiles are recommended for the particular application.

E. Cleaning up:

1. Remove masking tape immediately after joints have been tooled.
2. Clean adjacent surfaces free from sealant as the installation progresses, using solvent or cleaning agent recommended by the manufacturer of the sealant used.

END OF SECTION

DIVISION 8
DOORS & WINDOWS

SECTION 081113

METAL DOORS AND FRAMES

PART 1 - GENERAL

1.1 DESCRIPTION

- A. Work included: Provide metal doors and frames, which are not specifically described in other Sections of these Specifications, where shown on the Drawings, as specified herein, and as needed for a complete and proper installation.
- B. Related work:
 - 1. Documents affecting work of this Section include, but are not necessarily limited to, General Conditions, Supplementary Conditions, and Sections in Division I of these Specifications.
 - 2. Section 081416: Wood Doors
 - 3. Section 087100: Finish Hardware

1.2 QUALITY ASSURANCE

- A. Use adequate numbers of skilled workmen who are thoroughly trained and experienced in the necessary crafts and who are completely familiar with the specified requirements and the methods needed for proper performance of the work of this Section.
- B. Unless specifically otherwise approved by the Architect, provide all products of this Section from a single manufacturer.

1.3 SUBMITTALS

- A. Comply with pertinent provisions of Section 013400.
- B. Product data: Within 15 calendar days after the Contractor has received the Owner's Notice to Proceed, submit:
 - 1. Materials list of items proposed to be provided under this Section;
 - 2. Manufacturer's specifications and other data needed to prove compliance with the specified requirements;
 - 3. Shop Drawings showing details of each frame type, elevations of door designs, details of openings, and details of construction, installation, and anchorage.
 - 4. Manufacturer's recommended installation procedures which, when approved by the Architect, will become the basis for accepting or rejecting actual installation procedures used on the Work.

1.4 PRODUCT HANDLING

- A. Comply with pertinent provisions of Section 016400.

PART 2 - PRODUCTS

2.1 METAL FRAMES – STANDARD OPENINGS

- A. Type and design:
 - 1. Typical Frames. Provide frames of the types and dimensions shown on the Drawings, labeled or non-labeled as indicated on the Door Schedule in the Drawings, in 16 gage minimum construction, properly reinforced for the finish hardware. Provide frames with welded corners unless noted otherwise elsewhere or unless unachievable in existing opening.
- B. Finish:
 - 1. Preclean and shop prime each frame for finish painting which will be performed at the job site under Section 09900 of these Specifications.
- C. Acceptable manufacturers:
 - 1. The Amweld Building Products Inc. or equal products of Curries Manufacturing, Ceco, Inc. or Steelcraft when approved in advance by the Architect.

2.2 METAL FRAMES - HURRICANE AND BLAST RESISTANT OPENINGS

- A. Type and design:
 - 1. Provide frames meeting UFC 4-010-01 DoD Minimum anti-terrorism standards and impact resistant passing large missile impact for missile level D, 150 psf frame. Basis of Design- Ceco Multi-Solution Opening, D20, 14 gage, Category II, welded frame corner condition, fully grouted, wire anchor.
- B. Finish:
 - 1. Preclean and shop prime each frame for finish painting which will be performed at the job site under Section 09900 of these Specifications.
- C. Acceptable manufacturers:
 - 2. The Amweld Building Products Inc. or equal products of Curries Manufacturing, Ceco, Inc. or Steelcraft when approved in advance by the Architect.

2.3 METAL DOORS – HURRICANE AND BLAST RESISTANT OPENINGS

- A. Type and design:
 - 1. Provide doors meeting UFC 4-010-01 DoD Minimum anti-terrorism standards and impact resistant passing large missile impact for missile level D, 150 psf frame. Basis of Design- Ceco Multi-Solution Opening, D20, 14 gage, Category II.
- B. Finish:
 - 1. Preclean and shop prime each frame for finish painting which will be performed at the job site under Section 09900 of these Specifications.

C. Acceptable manufacturers:

3. The Amweld Building Products Inc. or equal products of Curries Manufacturing, Ceco, Inc. or Steelcraft when approved in advance by the Architect.

2.4 FINISH HARDWARE

- A. Secure templates from the finish hardware supplier, and accurately install, or make provision for, all finish hardware at the factory. Pre-drill frames for any silencers specified.
- B. Specialty hardware required for Multi Solution Opening per Hardware Section 087100.

PART 3 - EXECUTION

3.1 SURFACE CONDITIONS

- A. Examine the areas and conditions under which work of this Section will be performed. Correct conditions detrimental to timely and proper completion of the Work. Do not proceed until unsatisfactory conditions are corrected.

3.2 INSTALLATION

- A. Placing frames:
 1. Set frames accurately into position, plumbed, aligned, and braced securely until permanent anchors are set.
 2. After wall construction is completed, remove temporary braces and spreaders, leaving surfaces smooth and undamaged.
 3. At in-place construction, set frames and secure to adjacent construction with suitable anchorage devices. Set wire anchors per manufacturer's requirements. Provide "Z" fillers at each screw location.

3.3 ADJUST AND CLEAN

- A. Final adjustments:
 1. Check and readjust operating finish hardware items in hollow metal work just prior to final inspection.
 2. Leave work in complete and proper operating condition.
 3. Remove defective work and replace with work complying with the specified requirements.
- B. Immediately after erection, sand smooth all rusted and damaged areas of prime coat, and apply touchup of compatible air-drying primer.

END OF SECTION

SECTION 081416

WOOD DOORS

PART 1 - GENERAL

1.1 DESCRIPTION

- A. Work included: Provide wood doors, complete in place with finish hardware installed, where shown on the Drawings, as specified herein, and as needed for a complete and proper installation.
- B. Related work:
 - 1. Documents affecting work of this Section include, but are not necessarily limited to, General Conditions, Supplementary Conditions, and Sections in Division I of these Specifications.
 - 2. Section 081113: Metal Doors and Frames.
 - 3. Section 087100: Finish hardware.
 - 4. Section 099000: Painting.

1.2 QUALITY ASSURANCE

- A. Use adequate numbers of skilled workmen who are thoroughly trained and experienced in the necessary crafts and who are completely familiar with the specified requirements and the methods needed for proper performance of the work of this Section.
- B. In addition to complying with pertinent codes and regulations of governmental agencies having jurisdiction, comply with:
 - 1. "Architectural Woodwork Quality Standards" of the Architectural Woodwork Institute, premium grade for interior doors.

1.3 SUBMITTALS

- A. Comply with pertinent provisions of Section 013400.
- B. Product data: Within 15 calendar days after the Contractor has received the Owner's Notice to Proceed, submit:
 - 1. Materials list of items proposed to be provided under this Section;
 - 2. Manufacturer's specifications and other data needed to prove compliance with the specified requirements;

1.4 PRODUCT HANDLING

- A. Comply with pertinent provisions of Section 01640.
- B. Delivery:
 - 1. Deliver doors to site after the building has reached average prevailing humidity of its locality.
 - 2. Deliver doors in manufacturer's original containers, clearly marked with manufacturer's name, brand name, size, thickness, and identifying symbol on the covering.

3. Seal all four edges of unfinished doors when delivered to the job site.
- C. Storage:
1. Stack flat on 2" x 4" lumber, laid 12" from ends and across center.
 2. Under bottom door and over top of stack, provide plywood or corrugated cardboard to protect door surfaces.
 3. Store doors in area where there will be no great variations in heat, dryness, and humidity.
 4. Do not drag doors across one another; lift doors and carry them into position.

PART 2 - PRODUCTS

2.1 GENERAL

- A. Provide 1-3/4" thick, birch veneer face to match existing doors, cross-banded, particle board core, flush wood doors with glazed panels where called for, in the dimensions called for in the Door Schedule.
- B. Apply trim on face as may be indicated on the drawings
- C. Site finish wood doors in accordance with provisions of Section 09900 of these Specifications.
- D. Where double doors are indicated in the drawings, match grain color and match general grain style of the two doors on each side. Doors installed together with substantially differing grain patterns shall be rejected. The determination by the Architect shall govern.

2.2 WOOD DOORS

- A. Typical doors - provide "PC20 Series" as manufactured by Ampco Products, Inc., 4840 NW 128 Street Road, Opa Locka, Florida 33054, Tel: 305.821.5700, Fax: 305.688.5160, or an equal as approved in advance by the Architect.
- B. Fire rated doors – provide "MC20, 45, 60 and/or 90 Series" label wood fire rated doors as indicated on the drawings and these specifications as manufactured by Ampco Products, Inc., 4840 NW 128 Street Road, Opa Locka, Florida 33054, Tel: 305.821.5700, Fax: 305.688.5160, or an equal as approved in advance by the Architect.
Note: Door and frame assembly shall achieve minimum fire rating as indicated on the drawings.
- C. Other acceptable manufacturer's include Simpson Door Co., Algoma Hardwoods, Inc.,

PART 3 - EXECUTION

3.1 SURFACE CONDITIONS

- A. Examine the areas and conditions under which work of this Section will be performed. Correct conditions detrimental to timely and proper completion of the Work. Do not proceed until unsatisfactory conditions are corrected.

3.2 INSTALLATION

- A. Fitting and machining:
 1. Unless doors are completely fitted and machined at the mill, fit for width by planing and fit for height by sawing:

- a. Bottom: 1/2" clearance maximum.
 - b. Top: 1/8" clearance maximum.
 - c. Lock edge and hinge edge: Bevel 1/8" in 2" maximum.
- 2. Machine doors for hardware in accordance with recommendations of the hardware manufacturers, as the Architect has approved those recommendations.
- B. Receive and retain custody of finish hardware furnished for the work of this Section under Section 08710 of these Specifications and, except as otherwise directed by the Architect, install all such finish hardware in strict accordance with the recommendations of its manufacturer.
- C. Replace or rehang doors which are hingebound and do not swing or operate freely.

END OF SECTION

SECTION 08 33 00
INSULATED ROLLING SERVICE DOOR

PART 1 GENERAL

1.1 SUMMARY

- A. **Section Includes:** Motor operated overhead insulated rolling doors.
- B. **Related Sections:**
 - 1. 05 50 00 Metal Fabrications. Door opening jamb and head members.
 - 2. 06 10 00 Rough Carpentry. Door opening jamb and head members.
 - 3. Division 26. Electrical wiring and conduit, fuses, disconnect switches, connection of operator to power supply, and installation of control station and wiring
- C. **Products That May Be Supplied, But Are Not Installed Under This Section:**
 - 1. Control Station

1.2 SYSTEM DESCRIPTION

- A. **Design Requirements:**
 - 1. **Air Infiltration to Comply With:**
 - a. **ASHRAE**® Standard 90.1-2007, 2010 & 2013 req. of less than .3 CFM/FT2.
 - b. **IECC**® (International Energy Conservation Code) 2012 requirements of less than 1.0 CFM/FT2
 - 2. **Cycle Life:**
 - a. Design doors of standard construction for normal use of up to 20 cycles per day maximum, and an overall maximum of 50,000 operating cycles for the life of the door
 - 3. **Insulated Door Slat Material Requirements:**
 - a. Flame Spread Index of 35 and a Smoke Developed Index of 400 as tested per ASTM E84
 - b. Minimum R-value of 4.8 (U-value of 0.208) as calculated using the ASHRAE Handbook of Fundamentals
 - c. U-factor listing of 0.532 for entire door assembly
 - d. Insul. to be CFC Free with an Ozone Depletion Potential rating of zero.

1.3 SUBMITTALS

- A. Reference Section 01 33 00 Submittal Procedures; submit the following items:
 - 1. **Product Data**
 - 2. **Shop Drawings:** Include special conditions not detailed in Product Data. Show interface with adjacent work.
 - 3. **Quality Assurance/Control Submittals:**
 - a. Provide manufacturer ISO 9001:2015 registration
 - b. Provide manufacturer and installer qualifications - see below
 - c. Provide manufacturer's installation instruction
 - d. **Manufacturer must provide independent testing lab results proving .3 CFM/FT2 or less air infiltration**
 - 4. **Closeout Submittals:**
 - a. Operation and Maintenance Manual
 - b. Certificate stating that installed materials comply with this specification

1.4 QUALITY ASSURANCE

- A. **Qualifications:**
 - 1. **Manufacturer Qualifications:** ISO 9001:2015 registered and a minimum of five years' experience in producing doors of the type specified
 - 2. **Installer Qualifications:** Manufacturer's approval

1.5 DELIVERY STORAGE AND HANDLING

- A. Reference Section 01 66 00 Product Storage and Handling Requirements
- B. Follow manufacturer's instructions

1.6 WARRANTY

- A. **Standard Warranty:** Two years from date of shipment against defects in material and workmanship
- B. **Maintenance:** Submit for owner's consideration and acceptance of a maintenance service agreement for installed products

PART 2 PRODUCT

2.1 MANUFACTURER

- A. **Manufacturer:**
Cornell: 24 Elmwood Avenue, Mountain Top, PA 18707. Telephone: (800) 233-8366
- B. Alternates:
 - 1. Cookson
 - 2. Clopay

2.2 PRODUCT INFORMATION

- A. **Model:** ESD40

2.3 MATERIALS

- A. **Curtain:** Air infiltration rate of 0.29 CFM/FT², as tested per ASTM E283 validated by an independent testing agency. **Test report upon asking.**
 - 1. **Fabrication:**
 - a. **Slat Material:** No. 6B
 - 1) **Galvanized Steel with Finish as Described Below:** Manufacturer recommended gauge based on performance requirements. Minimum 22 gauge, Grade 40, ASTM A 653 galvanized steel zinc coating. Gray PVC backer slat
 - b. **Insulation:** 7/8 inch thick fire retardant mineral wool, ASTM C665-95 or ASTM C612-93
 - c. **Total Slat Thickness:** 15/16 inch
 - d. **U-factor:** U-factor rating of 0.532 for the entire assembly tested per DASMA-105
 - 2. **Finish (Front slat only):**
 - a. **SpectraShield® Coating System:**
 - 1) ASTM A 653 galvanized base coating treated with dual process rinsing agents in preparation for chemical bonding, gray baked-on base coat and gray baked-on polyester finish coat
 - 2) Zirconium treatment followed by baked-on polyester powder coat, with color as selected by Architect from manufacturer's standard color range, over 180 colors; minimum 2.5 mils cured film thickness; ASTM D-3363 pencil hardness: H or better
 - 3) **SpectraShield Ultra** – Ultra Powder Coat to be applied as a protective top coat over SpectraShield finish. Top coat is a polyester based structured wear resistant clear powder coat of 2.5-3.5 mils cured film thickness. ASTM D-3363 pencil hardness: 2H or better. Tested per ASTM B117

- B. **Endlocks:** Fabricate interlocking sections with high strength nylon on alternate slats each secured with two 1/4" rivets.
- C. **Bottom Bar**
1. **Insulated Bottom Bar:** Reinforced extruded aluminum interior face with full depth insulation and exterior skin slat to match curtain material and gauge. Minimum 4" tall x 1-1/16" thickness.
 - a. **Air Infiltration Certification Label:** Must be affixed to bottom bar
 2. **Finish:**
 - a. Powder coat to match slats
- D. **Guides:**
1. **Fabrication:**
 - a. **Thermal break required.** Minimum 3/16 inch structural steel angles. Provide windlock bars of same material when windlocks are required to meet specified wind load. Top of inner and outer guide angles to be flared outwards to form bellmouth for smooth entry of curtain into guides. Provide removable guide stoppers to prevent over travel of curtain and bottom bar.
 2. **Finish:**
 - a. **SpectraShield® Coating System:** Zirconium treatment followed by baked-on polyester powder coat, color as selected by Architect from manufacturer's standard color range, over 180 colors; minimum 2.5 mils cured film thickness; ASTM D-3363 pencil hardness: H or better
- E. **Counterbalance Shaft Assembly:**
1. **Barrel:** Steel pipe capable of supporting curtain load with maximum deflection of 0.03 inches per foot of width
 2. **Spring Balance:** Oil-tempered, heat-treated steel helical torsion spring assembly designed for proper balance of door to ensure that maximum effort to operate will not exceed 25 lbs. Provide wheel for applying and adjusting spring torque.
- F. **Brackets:**
Fabricate from minimum 3/16 inch steel plate with permanently lubricated ball or roller bearings at rotating support points to support counterbalance shaft assembly and form end closures
1. **Finish:**
 - a. **SpectraShield® Coating System:** Zirconium treatment followed by baked-on polyester powder coat, color as selected by Architect from manufacturer's standard color range, over 180 colors; minimum 2.5 mils cured film thickness; ASTM D-3363 pencil hardness: H or better
- G. **Hood:**
Minimum 24 gauge galvanized steel with reinforced top and bottom edges, square hood construction.
1. **Finish:**
 - a. **SpectraShield® Coating System:**
 - 1) ASTM A 653 galvanized base coating treated with dual process rinsing agents in preparation for chemical bonding, gray baked-on base coat and gray baked-on polyester finish coat
 - 2) Zirconium treatment followed by baked-on polyester powder coat, with color as selected by Architect from manufacturer's standard

color range, over 180 colors; minimum 2.5 mils cured film thickness;
ASTM D-3363 pencil hardness: H or better

H. **Weather stripping:**

- guides
1. **Bottom Bar:** Replaceable, bulb-style, compressible EDPM gasket extending into
 2. **Guides:** Replaceable vinyl strip on guides sealing against fascia side of curtain
 3. **Lintel Seal:** Double brush seal with EPDM sandwiched between the two brush seals at door header to impede air flow.

2.4 OPERATION

A. **Motor - Continuous Use - Model SG (Super Duty Gear Head) Operator:**

1. The operator must not extend above or below the door coil when mounted front-of-coil.
2. cULus listed (to comply with UL requirements in The United States and Canada).
3. Totally Enclosed Fan Cooled gear head operators rated 1/2 hp as recommended by door manufacture for size and type of door, 460 Volts, 3 Phase.
4. Provide complete with electric motor and factory pre-wired motor control terminals, maintenance free solenoid actuated brake, emergency manual chain hoist provided up to 2 hp and control station.
5. Motor shall be high starting torque, industrial type, with overload protection.
6. Primary speed reduction shall be heavy-duty gears running in grease or oil bath with mechanical braking to hold the door in any position.
7. When equipped, the emergency manual chain hoist assembly is automatically disengaged when motor is energized.
8. A disconnect chain shall not be required to engage or release the manual chain hoist.
9. Operator drive and door driven sprockets shall be provided with minimum #50 roller chain.
10. Operator shall be capable of driving the door at a speed of up to 9" per second or as recommended for door size.
11. Fully adjustable, driven linear screw type cam limit switch mechanism shall synchronize the operator with the door.
12. The motor shall be removable without affecting the limit switch settings.
13. The electrical contractor shall mount the control station and supply the appropriate disconnect switch, all conduit and wiring per the overhead door wiring instructions

B. **Control Stations:**

1. **Surface mounted:** "Open/Close/Stop" push buttons; NEMA 1 (standard)

C. **Control Operation:**

1. **Momentary Contact to Close:**
Fail-safe, UL325-2010 Compliant Entrapment Protection for Motor Operation.
 - a. **SafetyGard UL325 Light Curtain with Dynamic Sequential Blanking:**
Provide monitored, non-contact light curtain consisting of a transmitter and a receiver to be mounted to the guide assembly of the door in the provided mounting channel, projecting a thru beam across the width of the door for the height of the light curtain (3ft or 6ft depending on opening size of the

door). Interruption of beam before door fully closes shall cause door to immediately stop downward travel and reverse direction to the fully opened position

- b. **SmartSync Wireless Edge Kit** – continuously monitored, wireless sensing/weather edge seal extending full width of door bottom bar. Contact before door fully closes shall cause door to immediately stop downward travel and reverse direction to the fully opened position. Wireless edge kit will use Zigbee wireless technology. Radio band wireless sensing edges will not be permitted.

2.5 ACCESSORIES

A. Covers:

- 1. **Operator and Bracket Mechanism Cover:** Galvanized steel sheet metal cover to enclose exposed operating components at coil area of unit. Finish matching hood.

PART 3 EXECUTION

3.1 EXAMINATION

- A. Examine substrates upon which work will be installed and verify conditions are in accordance with approved shop drawings
- B. Coordinate with responsible entity to perform corrective work on unsatisfactory substrates
- C. Commencement of work by installer is acceptance of substrate

3.2 INSTALLATION

- A. General: Install door and operating equipment with necessary hardware, anchors, inserts, hangers and supports
- B. Follow manufacturer's installation instructions

3.3 ADJUSTING

- A. Following completion of installation, including related work by others, lubricate, test, and adjust doors for ease of operation, free from warp, twist, or distortion

3.4 CLEANING

- A. Clean surfaces soiled by work as recommended by manufacturer.
- B. Remove surplus materials and debris from the site

3.5 DEMONSTRATION

- A. Demonstrate proper operation to Owner's Representative
- B. Instruct Owner's Representative in maintenance procedures

END OF SECTION

SECTION 083301

HURRICANE PROTECTION ROLLING DOORS

PART 1 - GENERAL

1.1 SUMMARY

- A. **Section Includes:** Electric operated, automatic closing, overhead rolling doors

1.2 SYSTEM DESCRIPTION

A. **Certifications:**

1. Provide certification of compliance with ICC 500-2014 ICC/NSSA Standard for the Design and Construction of Storm Shelters
2. Provide certification of compliance with FEMA 361 Safe Rooms for Tornadoes and Hurricanes
3. Provide certification of compliance to sustain 300 psf wind pressure in accordance with ASTM E330.
4. Provide certification of compliance in accordance with the requirements of ASTM E1886 Large Missile Impact for FEMA 361 assemblies.

B. **Design Requirements:**

1. **Wind Loading:**
 - a. Supply doors to withstand at least 200 psf design wind load.

1.3 SUBMITTALS

- A. Reference Section 01 34 00–Submittal Procedures; submit the following items:

1. **Product Data**
2. **Shop Drawings:** Include special conditions not detailed in Product Data. Show interface with adjacent work.
3. **Certifications**
 - a. Provide certification of compliance with ICC 500-2014 ICC/NSSA Standard for the Design and Construction of Storm Shelters
 - b. Provide certification of compliance with FEMA 361 Safe Rooms for Tornadoes and Hurricanes
 - c. Provide certification of compliance to sustain 300 psf wind pressure in accordance with ASTM E330.
 - d. Provide certification of compliance in accordance with the requirements of ASTM E1886 Large Missile Impact for FEMA 361 assemblies.
4. **Manufacturer's installation instructions.**
5. **Closeout Submittals:**
 - a. Operation and Maintenance Manual.
 - b. Certificate stating that installed materials comply with this specification.
 - c. Warranty Statement

1.4 QUALITY ASSURANCE

A. **Qualifications:**

1. **Manufacturer Qualifications:** ISO 9001:2015 registered and a minimum of five years' experience in producing fire and smoke control units of the type specified.
2. **Installer Qualifications:** Manufacturer's approval.

1.5 DELIVERY STORAGE AND HANDLING

- A. Reference Section 01 64 00–Product Storage and Handling Requirements.
- B. Follow manufacturer's instructions.

1.6 WARRANTY

- A. **Standard Warranty:** Two years from date of shipment against defects in material and workmanship.
- B. **Maintenance:** Submit maintenance service agreement for installed products for owner's consideration and acceptance.

PART 2 PRODUCTS

2.1 MANUFACTURER

- A. **Manufacturer:**
Cornell: 24 Elmwood Avenue, Mountain Top, PA 18707. Telephone: (800) 233-8366.
- B. Alternates:
 - 1. Cookson
 - 2. Clopay

2.2 PRODUCT INFO

- A. **Model:** PSD361

2.3 MATERIALS

- A. **Curtain:**
 - 1. **Steel with Finish as Described Below:** Minimum 12 gauge, ASTM A1008 or ASTM A1011 grade 40 steel
 - 2. **Finish:**
 - a. **SpectraShield® Coating System:**
 - 1) Zirconium pre-treatment followed by baked-on polyester powder coat, with color as selected by Architect from manufacturer's standard color range; minimum 2.5 mils cured film thickness; ASTM D-3363 pencil hardness: H or better
 - 2) Zirconium treatment followed by baked-on polyester powder coat, with color as selected by Architect from manufacturer's standard color range, over 180 colors; minimum 2.5 mils cured film thickness; ASTM D-3363 pencil hardness: H or better
- B. **Endlocks:**
 - 1. Retention groove integrated into the body of the slat used to retain the slats within the guides.
 - 2. 16 gauge aluminum secured with tabs integrated into the body of the slat used to restrain the slats in a horizontal position relative to one another.
- C. **Bottom Bar:**
 - 1. **Configuration:**
 - a. 12G formed bottom bar profile with steel strengthening insert
 - 2. **Finish:**
 - a. **SpectraShield® Coating System:**
 - 1) Zirconium pre-treatment followed by baked-on polyester powder coat, with color as selected by Architect from manufacturer's standard color range; minimum 2.5 mils cured film thickness; ASTM D-3363 pencil hardness: H or better

D. **Guides:**

1. **Fabrication**

- a. Minimum 1/4 inch structural steel Top of inner and outer guide shapes to be flared outwards to form bellmouth for smooth entry of curtain into guides. Top 16 1/2" of coil side guide shapes to be removable for ease of curtain installation and as needed for future curtain service.

2. **Finish:**

a. **SpectraShield® Coating System:**

- 1) Zirconium treatment followed by baked-on polyester powder coat, with color as selected by Architect from manufacturer's standard color range, over 180 colors; minimum 2.5 mils cured film thickness; ASTM D-3363 pencil hardness: H or better

E. **Counterbalance Shaft Assembly:**

1. **Barrel:** Steel pipe capable of supporting curtain load with maximum deflection of 0.03 inches per foot of width
2. **Spring Balance:** Oil-tempered, heat-treated steel helical torsion spring assembly designed for proper balance of door.
3. Provide tension wheel for applying and adjusting spring torque.

F. **Brackets:** Fabricate from minimum 3/8 inch steel plate with permanently lubricated ball or roller bearings at rotating support points to support counterbalance shaft assembly and form end closures

1. **Finish:**

a. **SpectraShield® Coating System:**

- 1) Zirconium treatment followed by baked-on polyester powder coat, with color as selected by Architect from manufacturer's standard color range, over 180 colors; minimum 2.5 mils cured film thickness; ASTM D-3363 pencil hardness: H or better

G. **Hood:**

Minimum 24 gauge galvanized steel with reinforced top and bottom edges.

1. **Finish:**

a. **SpectraShield® Coating System:**

- 1) ASTM A 653 galvanized base coating treated with dual process rinsing agents in preparation for chemical bonding, gray baked-on base coat and gray baked-on polyester finish coat
- 2) Zirconium treatment followed by baked-on polyester powder coat, with color as selected by Architect from manufacturer's standard color range, over 180 colors; minimum 2.5 mils cured film thickness; ASTM D-3363 pencil hardness: H or better

2.4 OPERATION

A. **Motor Operation:**

1. **AlarmGard Plus Advanced Fire Door Motor Operation with Chain Hoist and Battery Backup:** UL, cUL listed NEMA 1 enclosure, horsepower as recommended by manufacturer, 460v three phase service. Provide a totally enclosed non ventilated motor, removable without affecting the setting of limit switches; thermal overload protection, planetary gear reduction, adjustable rotary limit switch mechanism and a transformer with 24v secondary output. All internal electrical components are to be prewired to terminal blocks.

- a. Provide a failsafe motor operated door assembly requiring no ancillary or externally mounted release devices, cables, chains, pulleys, reset handles or mechanisms
- b. Equip operator with an emergency manual chain hoist assembly that provides emergency operation during non-alarm power failure.
- c. Provide an internal electrical failsafe release device that requires no additional wiring, external cables or mounting locations.
- d. Provide an internal solenoid brake mechanism to hold the door at any position during normal door operation.
- e. Provide logic for [1] fully monitored safety reversing devices such that the failure of any single monitored device will cause the motor operator to automatically revert to constant pressure to close.
- f. Electrically activate door system automatic closure by notification from central alarm system or extended power failure.
- g. Provide an automatic alarm closure selectable time delay of zero or ten seconds.
- h. Control automatic closure speed with an internal, totally enclosed, variable rate centrifugal governor without the use of electrical pulsation, constant rate viscosity, oscillation type or other exposed governing devices.
- i. Maintain automatic closure speed at not more than 9" per second.
- j. Enable safety edge function during alarm closing while power is present for [3] cycles. Enable door to rest upon obstruction following this sequence.
- k. Electrically reset internal failsafe release device and door operating system upon restoration of electrical power and upon clearing of the alarm signal without requiring human interaction.
- l. Provide selectable ability for the door system to automatically self-cycle to the fully open position following automatic reset without requiring human interaction.
- m. Provide an integral, non-resettable cycle counter.
- n. Ensure that manual resetting of spring tension, release devices, linkages or mechanical dropouts will not be required.
- o. Provide minimum #50 roller chain for drive connection from motor drive assembly to the door drive shaft.
- p. Install system only with manufacturer supplied or specified fasteners.
- q. Notify electrical contractor to mount control station and supply the appropriate disconnect switch, all conduit and wiring per the door system wiring instructions.
- r. Drop test and reset door system twice by all means of activation and comply fully with NFPA 80 Section 5.

B. Control Stations:

1. **Surface mounted:** "Open/Close" key switch with "Best" core cylinder

C. Control Operation:

1. **Momentary Contact to Close:**

Fail-safe, UL325-2010 Compliant Entrapment Protection for Motor Operation.

- a. **SmartSync Wireless Edge Kit** – continuously monitored, wireless sensing/weather edge seal extending full width of door bottom bar. Contact before door fully closes shall cause door to immediately stop downward travel and reverse direction to the fully opened position. Wireless edge kit will use Zigbee wireless technology. Radio band wireless sensing edges will not be permitted

2.5 ACCESSORIES

A. Operator and Full Bracket Mechanism Cover:

1. Provide minimum 24 gauge galvanized steel sheet metal cover to enclose exposed moving operating components at coil area of unit. Finish to match door hood

PART 3 EXECUTION

3.1 EXAMINATION

- A. Examine substrates upon which work will be installed and verify conditions are in accordance with approved shop drawings.
- B. Coordinate with responsible entity to perform corrective work on unsatisfactory substrates.
- C. Commencement of work by installer is acceptance of substrate.

3.2 INSTALLATION

- A. General: Install door and operating equipment with necessary hardware, anchors, inserts, hangers and supports.

3.3 ADJUSTING

- A. Following completion of installation, including related work by others, lubricate, test, and adjust doors for ease of operation, free from warp, twist, or distortion.

3.4 FIELD QUALITY CONTROL

- A. Site Test: Test doors for normal operation and automatic closing.

3.5 CLEANING

- A. Clean surfaces soiled by work as recommended by manufacturer.
- B. Remove surplus materials and debris from the site.

3.6 DEMONSTRATION

- A. Demonstrate proper operation, testing and reset procedures to Owner's Representative.
- B. Instruct Owner's Representative in maintenance procedures

**SECTION 083310
ROLLING COUNTER SHUTTERS**

PART 1 GENERAL

1.1 SUMMARY

- A. Section Includes: Manual closing rolling counter doors.

1.2 SYSTEM DESCRIPTION

- A. Performance Requirements:
1. Provide doors with Underwriters' Laboratories, Inc. label.

1.3 SUBMITTALS

- A. Reference Section 013400 Submittal Procedures; submit the following items:
1. Product Data
 2. Shop Drawings: Include special conditions not detailed in Product Data. Show interface with adjacent work.
 3. Quality Assurance/Control Submittals:
 - a. Provide proof of manufacturer ISO 9001:2008 registration
 - b. Provide proof of manufacturer and installer qualifications - see 1.4 below
 - c. Provide manufacturer's installation instructions
 4. Closeout Submittals:
 - a. Operation and Maintenance Manual
 - b. Certificate stating that installed materials comply with this specification

1.4 QUALITY ASSURANCE

- A. Qualifications:
1. Manufacturer Qualifications: ISO 9001:2008 registered and a minimum of five years experience in producing counter fire doors and smoke control units of the type specified
 2. Installer Qualifications: Manufacturer's approval

1.5 DELIVERY STORAGE AND HANDLING

- A. Reference Section 01 66 00 - Product Storage and Handling Requirements
B. Follow manufacturer's instructions

1.6 WARRANTY

- A. Standard Warranty: Two years from date of shipment against defects in material and workmanship
B. Maintenance: Submit for owner's consideration and acceptance of a maintenance service agreement for installed products

PART 2 PRODUCTS

2.1 MANUFACTURER

- A. Basis of Design: Model ESC10 - Cornell Cookson, Inc. 24 Elmwood Avenue Mountain Top, PA 18707. Telephone: (800) 233-8366.
B. Alternates manufacturers:

ROLLING COUNTER SHUTTERS

2. Clopay Building Products

Substitutions: Only when approved by the architect.

2.2 MATERIALS

- A. Curtain:
 1. Slat Configuration:
 - a. Stainless Steel: No. 1F, interlocked flat-faced slats, 1-1/2 inches (38 mm) high by 1/2 inch (13 mm) deep, minimum 22 gauge AISI type 304 #4 finish stainless steel with stainless steel bottom bar and vinyl astragal
 2. Finish:
 - a. Stainless Steel: type 304 #4 finish
- B. Endlocks:

Fabricate continuous interlocking slat sections with high strength galvanized steel endlocks riveted to slats per UL requirements
- C. Guides:
 1. Configuration & Finish:
 - a. Stainless Steel: minimum 12 gauge formed shapes
 - 1) type 304 #4 finish
- D. Counterbalance Shaft Assembly:
 1. Barrel: Steel pipe capable of supporting curtain load with maximum deflection of 0.03 inches per foot (2.5 mm per meter) of width
 2. Spring Balance: Oil-tempered, heat-treated steel helical torsion spring assembly designed for proper balance of door to ensure that maximum effort to operate will not exceed 25 lbs (110 N). Provide wheel for applying and adjusting spring torque.
- E. Brackets:

Fabricate from reinforced steel plate with permanently lubricated ball or roller bearings at rotating support points to support counterbalance shaft assembly and form end closures

 1. Finish:
 - a. Powder Coat (Stock Colors): Zirconium treatment followed by a gray baked-on polyester powder coat; minimum 2.5 mils (0.065 mm) cured film thickness
- F. Hood and Mechanism Covers:

24 gauge stainless steel with reinforced top and bottom edges. Provide minimum 1/4 inch (6.35 mm) steel intermediate support brackets as required to prevent excessive sag.

 1. Finish:
 - a. Stainless steel: type 304 #4 finish

2.3 OPERATION

- A. Manual Operation:
 1. Manual Crank Operation: manually operated system with planetary gear reduction and internal release mechanism
 - a. Provide an internal brake mechanism to hold the door at any position during normal door operation
 - b. Control automatic closure speed with an internal, totally enclosed, variable rate centrifugal governor without the use of electrical pulsation, non-variable rate viscosity, oscillation type or other governing devices
 - c. Maintain automatic closure speed at an average of 12" (304mm) per second

ROLLING COUNTER SHUTTERS

083310-2

- d. Provide minimum #50 roller chain from operator output shaft to the door drive shaft
- e. Install system only with manufacturer supplied or specified fasteners
- f. Ensure that manual resetting of spring tension or mechanical components will not be required
- g. Drop test and reset door system twice by all means of activation and comply fully with NFPA 80 Section 5

2.4 ACCESSORIES

- A. Locking:
 - 1. Padlockable slide bolt: Padlockable slide bolt on coil side of bottom bar at each jamb extending into slots in guides.

PART 3 EXECUTION

3.1 EXAMINATION

- A. Examine substrates upon which work will be installed and verify conditions are in accordance with approved shop drawings
- B. Coordinate with responsible entity to perform corrective work on unsatisfactory substrates
- C. Commencement of work by installer is acceptance of substrate

3.2 INSTALLATION

- A. Install door and operating equipment with necessary hardware, anchors, inserts, hangers and supports
- B. Comply with NFPA 80 and follow manufacturer's installation instructions

3.3 ADJUSTING

- A. Following completion of installation, including related work by others, lubricate, test, and adjust doors for ease of operation, free from warp, twist, or distortion

3.4 FIELD QUALITY CONTROL

- A. Site Test: Test doors for normal operation and automatic closing. Coordinate with authorities having jurisdiction to witness test and sign Drop Test Form

3.5 CLEANING

- A. Clean surfaces soiled by work as recommended by manufacturer
- B. Remove surplus materials and debris from the site

3.6 DEMONSTRATION

- A. Demonstrate proper operation to Owner's Representative
- B. Instruct Owner's Representative in maintenance procedures

END OF SECTION

ROLLING COUNTER SHUTTERS

083310-3

SECTION 084213
WIND AND IMPACT SECURITY ALUMINUM ENTRANCES

PART 1 - GENERAL

1.1 SECTION INCLUDES

- A. Impact, Wind and Ballistic Resistant Aluminum Door Assemblies

1.2 ACTION SUBMITTALS

- A. Refer to Section 013400 Submittal Procedures.
- B. Product Data: For each type of door assembly, including manufacturer recommended installation instructions.
- C. Shop Drawings: Include plans, elevations, sections, details, attachment to other work and glazing details if field-glazed units called for.
- D. Samples: For each exposed finish.

1.3 INFORMATION SUBMITTALS

- A. Product Certificates: Indicating compliance with
 - 1. ICC 500- 2014 requirements
 - 2. UL 752 Level 3
- B. Warranty: Sample of finish warranty
- C. Qualification Data: For Installer and Testing Agency

1.4 CLOSEOUT SUBMITTALS

- A. Refer to Section 017000 Contract Closeout.
- B. Maintenance data.

1.5 DELIVERY, STORAGE AND HANDLING

- A. Refer to Section 016400 Product Handling.

1.6 WARRANTY

- A. Finish Warranty: Manufacturer's warranty against deterioration of factory finishes for the period of 10 years from the date of Substantial Completion.
- B. Glass Warranty: Manufacturer's warranty against defects in material and workmanship resulting in edge separation or delamination for a period of 5 years from the date of Substantial Completion.

PART 2 - PRODUCTS

2.1 ALUMINUM ENTRANCES

- A. Basis of Design: Insulgard STORMDEFEND TTH350 Tornado and Hurricane Storm Shelter

Aluminum Door Assembly by Insulgard Security Products; Phone 800.624.6315; website www.insulgard.com

1. Subject to compliance with requirements, manufacturers of products of equivalent design may be acceptable if approved by the Architect in accordance with these specifications.

B. Description

1. Factory fabricated door assembly constructed from either 6105-T5 or 6005-T5 extruded aluminum.
2. Dimensions: Wide Stile Door
 - a. Stiles: 5 inches by 2-3/8 inches
 - b. Top Rail: 7 inches by 2-3/8 inches
 - c. Bottom Rail: 8-1/2 inches by 2-3/8 inches
 - d. Glazing Stops: 1-3/4 inch face
3. Certification Label: Permanently mark unit with certification label of the certification agency acceptable to authorities having jurisdiction. Label to include manufacturers name, product name, design pressure; test pressure, missile criteria and ICC 500-2014 Certification Listing.

2.2 GLAZING

- A. Wind, Impact and Level 3 Ballistic Resistant Laminated Glazing, tinted: TOR-GARD 30

2.3 PERFORMANCE CRITERIA

- A. Indicated areas of this project have been design for occupancy as a storm shelter. The Work identified in this Section is a component of that security occupancy as follows:

1. Type of Shelter: Hurricane
- B. Shelter Design Wind Speeds: As specified in the Drawings.
- C. Debris Hazard
 1. ICC 500 2014 Compliant: Pass missile-impact tests according to ICC 500-2014 in accordance with:
 - a. ASTM E1886 - Standard Test Method for Performance Of Exterior Windows, Curtain Walls, Doors And Impact Protective Systems Impacted By Missiles and Exposed To Cyclic Pressure Differentials
 - b. ASTM E1996 - Standard Specification for Performance of Exterior Windows, Curtain Walls, Doors and Impact Protective Systems Impacted by Windborne Debris in Hurricanes.
 2. Hurricane: Resists impact of a 9 pound 2 by 4 at 80mph.
- D. Pressure Testing
 1. ICC 500-2014 Compliant in accordance with:
 - a. ASTM E1886 - Standard Test Method for Performance Of Exterior Windows, Curtain Walls, Doors And Impact Protective Systems Impacted By Missiles and Exposed To Cyclic Pressure Differentials
- E. Ballistic Resistant: Level 3 in accordance with UL 752 - Standard for Bullet-Resisting Equipment

2.4 FABRICATION

- A. Tolerances: All joints and connections shall be tight, providing hairline joints and true alignment of adjacent members.
- B. Door corner joinery of extruded and keyed aluminum spline with a continuous 3/8 inch diameter steel tie rod at top and bottom rails.

2.5 FINISH

- A. Factory-applied finish:
 - 1. PVDF-Based Coating: Fluoropolymer finish containing minimum 70 percent PVDF resins, in accordance with AAMA 2605 "Voluntary Specification, Performance Requirements and Test Procedures for Superior Performance Organic Coatings on Aluminum Extrusions and Panels"
 - a. Coats: three coat system,
 - b. Color: to be selected from manufacturer's full color range.

2.6 ACCESSORIES

- A. Anchors: Fully concealed.
- B. Glazing Gaskets: Manufacturer supplied EPDM gasket utilized as component of the tested assembly.

2.7 DOOR HARDWARE

- A. Manufacturer standard acceptable door hardware.
- B. Exit Device - Electrified Surface Vertical Rod: Sargent FM8774 with 306 Auxiliary Control, Electrolynx Harness QC-C1500P Hinge to ETL Trim, Securitron DPS-M-GY Door Position Switch.
- C. Surface Door Closer: Sargent 351.
- D. Continuous Gear Hinge: Pemko FMSLF
- E. Threshold: Pemko 172A.
- F. Door Bottom Sweep: Pemko 18061.
- G. Latch Guard Cover: Rockwood BFLG1050.

PART 3 - EXECUTION

3.1 PREPARATION

- A. Verify field dimensions of opening prior to fabrication of door assemblies.
- B. Coordinate structural requirements to ensure proper attachment and support.

3.2 INSTALLATION

- A. Install doors and frames in accordance with manufacturer's recommendations and approved shop drawings.

- B. Provide required support and securely fasten and set doors and frames plumb, square, and level without twist or bow.
- C. Apply sealant in accordance with door and sealant manufacturer's recommendations as indicated in installation instructions. Wipe off excess, and leave exposed sealant surfaces clean and smooth

3.3 ADJUSTING AND CLEANING

- A. Adjust door to provide for correct operation and weather tightness.

(Specifier Note: The glazing utilized in this system contains polycarbonate, an impact resistant plastic that could be affected by some chemicals commonly used in the glass industry. Extreme caution should be used especially as related to cleaning products, sealants, setting blocks, gaskets and tape. Use of incompatible products may void the warranty.)

- B. Clean in strict accordance with manufacturer's recommended cleaning procedures using recommended cleaning agents.

3.4 PROTECTION

- A. Protect doors and glazing from damage during construction operations. If damage occurs, remove and replace as required to provide doors in their original, undamaged condition.
 - 1. In addition to breakage, damage includes but is not limited to crazing, cracking, fissures and delamination.

END OF SECTION

SECTION 085653
WIND AND IMPACT SECURITY WINDOWS

PART 1 - GENERAL

1.1 SECTION INCLUDES

- A. Impact, Wind and Bullet Resistant Aluminum Security Windows.

1.2 ACTION SUBMITTALS

- A. Refer to Section 013400 Submittal Procedures
- B. Product Data: For each type of framing and glazing including manufacturer recommended installation instructions.
- C. Shop Drawings: Include plans, elevations, sections, details, attachment to other work and glazing details for field-glazed units.
- D. Samples: For each exposed finish.

1.3 INFORMATIONAL SUBMITTALS

- A. Product Certificates: Indicating compliance with
 - 1. ICC 500 - 2014 requirements
 - 2. UL 752 Level 3
- B. Qualification Data: For Installer and Testing Agency.
- C. Warranty: Sample of finish warranty

1.4 CLOSEOUT SUBMITTALS

- A. Refer to Section 017000 Contract Closeout.
- B. Maintenance data.

1.5 DELIVERY, STORAGE AND HANDLING

- A. Refer to Section 016400 Product Handling.

1.6 WARRANTY

- A. Finish Warranty: Manufacturer's warranty against deterioration of factory finishes for the period of 10 years from the date of Substantial Completion.
- B. Glass Warranty: Manufacturer's warranty against defects in material and workmanship resulting in edge separation or delamination for a period of 5 years from the date of Substantial Completion.

PART 2 - PRODUCTS

2.1 FRAMING

- A. Basis of Design: Insulgard STORMDEFEND TTH600 Tornado and Hurricane Storm Shelter

Window System by Insulgard Security Products; Phone 800.624.6315; website www.insulgard.com

1. Subject to compliance with requirements, manufacturers of products of equivalent design may be acceptable if approved by the Architect in accordance with these specifications.

B. Description

1. Factory fabricated framing constructed from either 6005-T5 or 6105-T5 extruded aluminum with integral weep design to allow water to vent to the exterior along horizontal members. Thermal separation of frame using polyamide strip.
2. Dimensions:
 - a. Head, Jamb, and Sill Members: 2-1/2 inches by 6 inches.
 - b. Mullion and Intermediate Horizontal Members: 3-1/4 inch face
3. Unit to be permanently marked with certification label of the certified testing agency acceptable to the authorities having jurisdiction. Label to include:
 - a. Design Pressure
 - b. Tested Pressure
 - c. Missile Criteria
 - d. ICC-500 2014 Certification Listing

2.2 GLAZING

A. Glazing Material: Insulating Glass Clad Polycarbonate, tinted glazing.

1. Wind, Impact and Level 3 Ballistic Resistant Glazing: TOR-GARD 30 IG

2.3 PERFORMANCE CRITERIA

A. Indicated areas of this project have been designed for occupancy as a storm shelter. The Work identified in this Section is a component of that security occupancy as follows:

1. Type of Shelter: Hurricane.

B. Shelter Design Wind Speeds: as specified in the Drawings.

C. Debris Hazard

1. ICC 500 2014 Compliant: Pass missile-impact tests according to ICC 500-2014 in accordance with:

- a. ASTM E1886 - Standard Test Method For Performance Of Exterior Windows, Curtain Walls, Doors And Impact Protective Systems Impacted By Missiles and Exposed To Cyclic Pressure Differentials
- b. ASTM E1996 - Standard Specification for Performance of Exterior Windows, Curtain Walls, Doors and Impact Protective Systems Impacted by Windborne Debris in Hurricanes.

2. Hurricane: Resists impact of a 9 pound 2 by 4 at 80mph.

D. Pressure Testing

1. ICC 500-2014 Compliant: Pass static pressure tests and cyclic tests according to ICC 500-2014 in accordance with:

- a. ASTM E1886 - Standard Test Method For Performance Of Exterior Windows, Curtain Walls, Doors And Impact Protective Systems Impacted By Missiles and Exposed To Cyclic Pressure Differentials
- E. Ballistic Resistant: Level 3 in accordance with UL 752 – Standard for Bullet-Resisting Equipment.
- F. Energy Performance: Certify and label energy performance according to NFRC as follows:
 - 1. NFRC Model Size: 47-1/4 by 59 inches
 - 2. Thermal Transmittance (U-factor): Fixed glazing and framing areas shall have U-factor of not more than 0.37 as determined according to NFRC 100.
 - 3. Solar Heat Gain Coefficient: Fixed glazing and framing areas shall have a solar heat gain coefficient of no greater than 0.45 as determined according to NFRC 200.
 - 4. Condensation Resistance: Fixed glazing and framing areas shall have an NFRC-certified condensation resistance rating of no less than 60 as determined according to NFRC 500.

2.4 FABRICATION

- A. Tolerances: All joints and connections shall be tight, providing hairline joints and true alignment of adjacent members

2.5 FRAMING FINISH

- A. Factory-applied finish:
 - 1. PVDF-Based Coating: Fluoropolymer finish containing minimum 70 percent PVDF resins, in accordance with AAMA 2605 "Voluntary Specification, Performance Requirements and Test Procedures for Superior Performance Organic Coatings on Aluminum Extrusions and Panels"
 - a. Coats: three coat system,
 - b. Color: to be selected from manufacturer's full color range.

2.6 ACCESSORIES

- A. Anchors: Fully concealed in accordance with performance requirements
- B. Glazing Gaskets: Manufacturer supplied EPDM gasket utilized as component of the tested assembly.

PART 3 - EXECUTION

3.1 PREPARATION

- A. Verify field dimensions of opening prior to fabrication of windows.
- B. Coordinate structural requirements to ensure proper attachment and support.

3.2 INSTALLATION

- A. Install windows in accordance with manufacturer's recommendations and approved shop drawings.
- B. Provide required support and securely fasten and set windows plumb, square, and level without twist or bow.
- C. Apply sealant in accordance with window and sealant manufacturer's recommendations as indicated in installation instructions. Wipe off excess, and leave exposed sealant surfaces clean and smooth

3.3 CLEANING

- A. Clean in strict accordance with manufacturer's recommended cleaning procedures using recommend cleaning agents.

3.4 PROTECTION

- A. Protect windows from damage during construction operations. If damage occurs, remove and replace as required to provide windows in their original, undamaged condition.
 - 1. In addition to breakage, damage includes but is not limited to crazing, cracking, fissures and delamination.

END OF SECTION

SECTION 087100

FINISH HARDWARE

PART 1 - GENERAL

1.1 DESCRIPTION

- A. Work included:
 - 1. Furnish finish hardware required to complete the Work as shown on the Drawings and as specified herein;
 - 2. Furnish trim attachments and fastenings, specified or otherwise required, for proper and complete installation;
 - 3. Deliver to the job site those items of finish hardware scheduled to be installed at the job site; and deliver to other points of installation those items of finish hardware scheduled to be factory installed.
- B. Definition: "Finish Hardware" includes items known commercially as finish hardware which are required for swing, sliding and folding doors, except types of unique and non-matching hardware specified in the same section as the door and door frame.
- C. Related work:
 - 1. Documents affecting work of this Section include, but are not necessarily limited to, General Conditions, Supplementary Conditions, and Sections in Division 1 of these Specifications.
 - 2. Installation of finish hardware is described in other Sections of these Specifications.

1.2 QUALITY ASSURANCE

- A. Use adequate numbers of skilled workmen who are thoroughly trained and experienced in the necessary crafts and who are completely familiar with the specified requirements and the methods needed for proper performance of the work of this Section.
- B. Manufacturer: Unless noted otherwise, obtain each type of hardware (latch and lock sets, hinges, closers, etc.) from a single manufacturer, although several may be indicated as offering products complying with the requirements of this Section.
- C. Supplier: A recognized architectural finish hardware supplier, with warehousing facilities, who has been furnishing hardware in the project's vicinity for a period of not less than 2 years, and who is, or who employs an experienced Architectural Hardware Consultant who is available, at reasonable times during the course of the work, for consultation about the project's hardware requirements, to Owner, Architect and Contractor.
- D. Substitutions: Requests for substitutions must be submitted in writing to the Architect at least ten (10) working days prior to the bid opening. All requests must be accompanied by sufficient catalog data to enable the Architect to render a decision.

1.3 SUBMITTALS

- A. Comply with pertinent provisions of Section 013400.
- B. Product data: Within 15 calendar days after the Contractor has received the Owner's Notice to Proceed, submit:

1. Materials list of items proposed to be provided under this Section, including information necessary to show compliance with requirements and instructions for installation and maintenance of finish hardware.
 2. Hardware Schedule: Submit final hardware schedule in the manner indicated below. Coordinate hardware with doors, frames and related work to ensure proper size, thickness, hand, function and finish of hardware.
 3. Final Hardware Schedule Content: Based on finish hardware indicated, organize hardware schedule into "hardware sets" indicating complete designations of every item required for each door opening. Include the following information:
 - a. Type, style, function, size and finish of each hardware item.
 - b. Name and manufacturer of each item.
 - c. Fastenings and other pertinent information.
 - d. Location of hardware set cross-referenced to indications on drawings both on floor plans and in door and frame schedule.
 - e. Explanation of all abbreviations, symbols, codes, etc., contained in schedule.
 - f. Mounting locations for hardware.
 - g. Door and frame sizes and materials.
 - h. Keying information.
- C. Submittal Sequence: Submit schedule at earliest possible date, particularly where acceptance of hardware schedule must precede fabrication of other work (e.g., hollow metal frames) which is critical in the project construction schedule. Include with the schedule the product date, samples, shop drawings of other work affected by finish hardware, and other information essential to the coordinated review of hardware schedule.
- D. Templates: Furnish hardware templates to each fabricator of doors, frames and other work to be factory-prepared for the installation of hardware. Upon request, check shop drawings of such other work, to confirm that adequate provisions are made for proper location and installation of hardware. To maintain progress of the Work, deliver templates or physical samples of the approved finish hardware items to pertinent manufacturers of interfacing items such as doors and frames.

1.4 PRODUCT HANDLING

- A. Comply with pertinent provisions of Section 013400.
- B. Tag each item or package separately with identification related to final hardware schedule, and include basic installation instructions with each item or package.
- C. Packaging of hardware is the responsibility of the supplier. As material is received by the hardware supplier from various manufacturers, sort and repackage in containers clearly marked with appropriate hardware set number to match set numbers of approved hardware schedule. Two or more identical sets may be packed in same container.
- D. Inventory hardware jointly with representatives of hardware supplier and hardware installer until each is satisfied that count is correct.
- E. Deliver individually packaged hardware items at the proper time to the proper locations (shop or project site) for installation.
- F. Provide secure lock-up for hardware delivered to the project, but not yet installed. Control handling and installation of hardware items which are not immediately replaceable, so that completion of the work will not be delayed by hardware losses, both before and after installations.

PART 2 - PRODUCTS

2.1 GENERAL

- A. Fasteners:
 - 1. All hardware shall be furnished complete with proper fastening suitable for the items to be installed as recommended by the manufacturer. All fastenings shall match in finish the item with which they are used.
 - 2. Template butts for metal doors and frames to have all machine screws. Closer arm brackets shall be fastened with thru bolts and sex nuts. All strikes or locksets, flush bolts, etc., require machine screws when used with thru bolts and sex nuts.

2.2 ACCEPTABLE PRODUCTS

- A. General:
 - 1. Except as specifically otherwise approved in advance by the Architect, furnish for each item only the product of a single manufacturer.
 - 2. For each of the required items of finish hardware provide from the specified manufacturer or from one of the indicated acceptable substitutes.
- B. Butt Hinges (Standard): Unless otherwise specified, all door jambs hung shall have butt hinges of the number, type, weight and finish as specified, and with flat button tips. Butt hinges of sufficient size, of the type required, shall be in all instances furnished to permit all doors, where possible, to swing 180 degrees. Butts manufactured by Hager, McKinney or Lawrence will be acceptable.
- C. Butt Hinges (Heavy Weight): Provide only McKinney SP3786 (or approved equal) full mortise butt hinges.
- D. Locksets: Locksets shall be equal to Corbin/Ruswin 3300 or 3500 Series Design or as noted in the Hardware Set Schedules.
- E. Lockset system (Ext. Metal Doors): Provide Corbin Ruswin BL6600 Series heavy duty mortise lock with four latching points.
- F. Closers (Standard): Closers shall be equal to Corbin/Ruswin series DC3000 Multi-sized closers unless noted otherwise.
- G. Closers (Ext. Metal Doors): Closers shall be Corbin Ruswin DC8000 Series or approved equal (thru bolt mounting.)
- E. Door Stops: For interior doors furnish wall stops equal to Ives 408-1/2 wherever possible. Where wall stops cannot be used furnish floor stops equal to Ives FS436 or FS438 with risers where necessary.
- F. Door Holders: Furnish Ives Plunger Type Door Holder No. FS1154 or approved equal.
- G. Thresholds: Thresholds shall be equal to National Guard, Pemko or and equal as approved by the Architect.
- H. Weatherstripping: Weatherstripping shall be equal to National Guard, Pemko or an equal as approved by the Architect.
- I. Pushes/Pulls: Furnish Ives, Hager or Rockwood Mfg. products as approved by the Architect.

- J. Exit Devices: Exit devices shall be equal to Corbin/Russwin ED5000 series. All doors with exit device shall have Classroom function, "Newport" lever acting trim on opposite side of door, in satin stainless steel finish.
- K. Manual Flush Bolts (Metal Doors): Manual Concealed Lever Extension Flush Bolts for use in metal doors. Ives FB458 to be placed in top and bottom of door.
- L. Manual Flush Bolts (Wood Doors): Manual Concealed Lever Extension Flush Bolts for use in wood doors. Ives FB358 to be placed in top and bottom of door.

2.3 KEYING

- A. Furnish three keys for each lock.
- B. Identification and delivery: All keys to be stamped "DO NOT DUPLICATE"
- C. Provide master keying as required by the Owner including subsets keyed under the master as required for the Owner's needs.

2.4 TOOLS AND MANUALS

- A. With the delivery of permanent keys, deliver to the Owner one complete set of adjustment tools and one set of maintenance manuals for locksets, latchsets, closers.

2.5 OTHER MATERIALS

- A. Provide other materials, not specifically described but required for a complete and proper installation, as selected by the Contractor subject to the approval of the Architect.

PART 3 - EXECUTION

3.1 DELIVERIES

- A. Stockpile items sufficiently in advance to assure their availability, and make necessary deliveries in a timely manner to assure orderly progress of the total Work.

3.2 COORDINATION

- A. Coordinate as necessary with other trades to assure proper and adequate provision in the work of those trades for interface with the work of this Section.

3.3 FINISH HARDWARE SCHEDULE

HW SET-1

- 01 For hardware see Section 084213, Wind and Impact Security Aluminum Entrances. Provide doors with exit devices.

HW SET-2

02,03,04,06	2 Pr. Heavy Weight Butt Hinges	McKinney SP3786 4-1/2 x 4-1/2 NRP	32D
07,08	1 Classroom Lockset	BL6618 NS	630
	1 Rim Exit Device	ED5200	626
	1 Closer	DC8210 A3	626
	1 Threshold	172D	Alum
	1 Door Bottom	210 DPK	Alum
	1 set weatherstripping		

HW SET-3 05	Hardware set per Hurricane Protection Rolling Doors Section 083301.		
HW SET-4 09,10,11,16 20,21,22,25 27,29,30,31 32,35	1-1/2 pr. Butt Hinges 1 Classroom Lockset 3 Silencers Door Stop	BB1199 4-1/2 x 4-1/2 NRP CL3555 NZD	32D 630
HW SET-5 12,13,14,15	Door Hinges 1 Heavy Duty Overhead Door Track 1 Door Lock 2 Knob Pulls	Knape & Vogt PB1064	26D 26D
HW SET-6 17,19	3 pr. Butt Hinges 2 Classroom Locksets 2 Rim Exit Device 2 Closers 2 Door Stops Floor Mount 1 set silencers Door frame shall be equipped with removable vertical center mullion.	BB1199 4-1/2 x 4-1/2 NRP CL3555 NZD ED5200 DC3210 A3	32D 630 626
HW SET-7 18	Hardware set per Operable Wall Partition Section 102226.		
HW SET-8 23,24,26,28	1-1/2 pr. Butt Hinges 1 Passage Latchset 3 Silencers Door Stop	BB1199 4-1/2 x 4-1/2 NRP CL3510 NZD	32D 630
HW SET-9 33	3 pr. Butt Hinges 1 Classroom Lockset 1 set of Concealed Vertical Extension Flush Bolts on inactive leaf	BB1199 4-1/2 x 4-1/2 NRP CL3555 NZD	32D 630 26D
HW SET-10 34	Hardware per Insulated Rolling Service Doors Section 083300		

END OF SECTION

SECTION 088000

GLAZING

PART 1 - GENERAL

1.1 DESCRIPTION

- A. Work included: Provide glazing and glazing accessories where shown on the Drawings, as specified herein, and as needed for a complete and proper installation.
- B. Related work:
 - 1. Documents affecting work of this Section include, but are not necessarily limited to, General Conditions, Supplementary Conditions, and Sections in Division I of these Specifications.
 - 2. Section 081416: Wood Doors
 - 3. Section 084000: Aluminum Entrances and Storefronts

1.2 QUALITY ASSURANCE

- A. Use adequate numbers of skilled workmen who are thoroughly trained and experienced in the necessary crafts and who are completely familiar with the specified requirements and the methods needed for proper performance of the work of this Section.
- B. In addition to complying with pertinent codes and regulations of governmental agencies having jurisdiction, comply with pertinent recommendations contained in:
 - 1. Flat Glass Marketing Association:
 - a. "Glazing Sealing Systems Manual";
 - b. "Glazing Manual."

1.3 SUBMITTALS

- A. Comply with pertinent provisions of Section 013400.
- B. Product data: Within 30 calendar days after the Contractor has received the Owner's Notice to Proceed, submit:
 - 1. Materials list of items proposed to be provided under this Section;
 - 2. Manufacturers' specifications and other data needed to prove compliance with the specified requirements;
 - 3. Manufacturers' recommended installation procedures which, when approved by the Architect, will become the basis for accepting or rejecting actual installation procedures used on the Work.

1.4 PRODUCT HANDLING

- A. Comply with pertinent provisions of Section 016400.
- B. During storage and handling of glass, provide cushions at edges to prevent impact damage.

PART 2 - PRODUCTS

2.1 GLASS

A. General:

1. For all glass, provide the type and thickness as specified herein or as indicated on the Drawings.
2. All glass used in interior storefront system shall be clear float glass, tempered where required and called for.
3. All glass used in exterior wall door and window systems – refer to other spec sections for Wind and Impact Security Entrance and Window systems.

B. Tempered glass:

1. Provide tempered glass 1/4" thick at storefronts, in interior windows where indicated on the Drawings, and elsewhere as required by governmental agencies.

C. Glass for tempering:

1. For plate glass or float glass, use type I, class 1, quality q3;
2. Sizes and cutting:
 - a. Prior to tempering or heat treating, cut glass to required sizes as determined by accurate measurements of the openings to be glazed, making allowances for required edge clearances.
 - b. Cut and process edges in accordance with the glass manufacturer's recommendations.
 - c. Do not cut or treat edges in the field.
3. Fully tempered glass:
 - a. Comply with Fed Spec DD-G-1403 and ANSI Z97.1.
 - b. Wherever possible, locate tong marks along an edge which will be concealed in the glazing system.

2.2 OTHER MATERIALS

- A. Provide other materials, not specifically described but required for a complete and proper installation, as selected by the Contractor subject to the approval of the Architect.

PART 3 - EXECUTION

3.1 SURFACE CONDITIONS

- A. Examine the areas and conditions under which work of this Section will be performed. Correct conditions detrimental to timely and proper completion of the Work. Do not proceed until unsatisfactory conditions are corrected.
- B. Clean glazing channels, stops, and rabbets to receive the glazing materials, making free from obstructions and deleterious substances which might impair the work.
 1. Remove protective coatings which might fail in adhesion or interfere with bond of sealants.
 2. Comply with manufacturers' instructions for final wiping of surfaces immediately prior to application of primer and glazing compounds or tapes.

3. Prime surfaces to receive glazing compounds in accordance with manufacturers' recommendations.

3.2 INSTALLATION

- A. Inspect each piece of glass immediately prior to start of installation.
 1. Do not install items which are improperly sized, have damaged edges, or are scratched, abraded, or damaged in any other manner.
 2. Do not remove labels from glass until so directed by the Architect.
 3. Install glass so distortion waves, if present, run in the horizontal direction.
- B. Locate setting blocks at sills one quarter of the width of the glass in from each end of the glass, unless otherwise recommended by the glass manufacturer.
 1. Use blocks of proper size to support the glass in accordance with the manufacturer's recommendations.
 2. Provide spacers for all glass sizes larger than 50 united inches, to separate glass from stops; except where continuous glazing gaskets or felts are provided.
 - a. Locate spacers no more than 24" apart, and no closer than 12" to a corner.
 - b. Place spacers opposite one another.
 - c. Make bite of spacer on glass 1/4" or more.
- C. Set glass in a manner which produces the greatest possible degree of uniformity in appearance.
- D. Do not use two different glazing materials in the same joint system unless the joint use is approved in advance by the Architect.
- E. Mask, or otherwise protect, surfaces adjacent to installation of sealants.
- F. Miter-cut and seal the joints of glazing gaskets in accordance with the manufacturer's recommendations, to provide watertight and airtight seal at corners and other locations where joints are required.

3.3 PROTECTION

- A. Protect glass from breakage after installation by promptly installing streamers or ribbons, suitably attached to the framing and held free from glass. Do not apply warning markings, streamers, ribbons, or other items directly to the glass except as specifically directed by the Architect.

END OF SECTION

**DIVISION 9
FINISHES**

SECTION 092216

METAL STUD SYSTEM

PART 1 – GENERAL

1.1 DESCRIPTION

- A. Work included: Provide metal studs and accessories as indicated on the Drawings, as specified herein and as needed for a complete and proper installation.
- B. Related Work:
 - 1. Documents affecting work of this Section include, but are not necessarily limited to, General Conditions, Supplementary Conditions and Sections in Division 1 of these Specifications.

1.2 QUALITY ASSURANCE

- A. Use adequate numbers of skilled workmen who are thoroughly trained and experienced in the necessary crafts and who are completely familiar with the specified requirements and the methods needed for proper performance of the work of this Section.
- B. In addition to complying with the pertinent codes and regulations of governmental agencies having jurisdiction, comply with pertinent recommendations contained in American Iron and Steel Institute (AISI) Specification for the Design of Cold Formed Steel Structural Members, latest edition.

1.3 SUBMITTALS

- A. Comply with pertinent provisions of Section 013400.
- B. Product data: Within 35 calendar days after the Contractor has received the Owner's Notice to Proceed, submit:
 - 1. Materials list of items proposed to be provided under this Section.
 - 2. Manufacturer's specifications and other data needed to prove compliance with the specified requirements.
 - 3. Manufacturer's recommended installation procedures which, when approved by the Architect, will become the basis for accepting or rejecting actual installation procedures used on the Work.

1.4 PRODUCT HANDLING

- A. Comply with pertinent provisions of Section 016400.

PART 2 – PRODUCTS

2.1 METAL STUDS AND ACCESSORIES

- A. Meet or exceed minimum requirements of ASTM A653, minimum yield strength of 33,000 psi.

- B. Metal studs:
 - 1. At interior partitions, unless shown otherwise on the Drawings, provide 3-5/8", 20 gage, standard punched steel "C" studs with G60 galvanized coating or equivalent.
- C. Accessories: Provide all accessories including, but not necessarily limited to, tracks, clips, anchors, fastening devices and other accessories required for a complete and proper installation as recommended by the manufacturer of the steel studs used.

1.2 GROUT

- A. Provide a good grade of commercial grout for leveling the floor track member of steel stud framing as required.

PART 3 – EXECUTION

3.1 SURFACE CONDITIONS

- A. Examine the areas and conditions under which work of this Section will be performed. Correct conditions detrimental to timely and proper completion of the Work. Do not proceed until unsatisfactory conditions are corrected.

3.2 INSTALLATION

- A. Accurately layout partition and wall lines from the dimensions shown on the Drawings.
- B. Install metal studs and accessories in strict accordance with the manufacturer's recommendations as approved by the Architect, anchoring all components firmly into position.
- C. Align partition and wall assemblies to a tolerance of one in 200 horizontally and one in 500 vertically.
- D. Coordination:
 - 1. Space the studs as required for compliance with pertinent regulations, to give proper support for the covering materials and as indicated on the Drawings.
 - 2. Coordinate and provide required backing and other support for items to be mounted on the finished covering.
 - 3. Coordinate requirements for pipes and other items designed to be housed within the partition and wall systems.

3.3 LEVELING

- A. By use of the specified grout or other means approved by the Architect, provide continuous solid bearing under floor track members of steel stud partitions and walls.
- B. Level in a manner to provide uniform interface with ceilings and other overhead construction.

END OF SECTION

SECTION 092600

GYPSUM WALLBOARD SYSTEM

PART 1 - GENERAL

1.1 DESCRIPTION

- A. Work included: Provide gypsum drywall and accessories in all wall and ceiling surfaces called for on the Drawings and as specified herein, and as needed for a complete and proper installation.
- B. Related work:
 - 1. Documents affecting work of this Section include, but are not necessarily limited to, General Conditions, Supplementary Conditions, and Sections in Division I of these Specifications.

1.2 QUALITY ASSURANCE

- A. Use adequate numbers of skilled workmen who are thoroughly trained and experienced in the necessary crafts and who are completely familiar with the specified requirements and the methods needed for proper performance of the work of this Section.

1.3 SUBMITTALS

- A. Comply with pertinent provisions of Section 013400.
- B. Product data: Within 15 calendar days after the Contractor has received the Owner's Notice to Proceed, submit:
 - 1. Materials list of items proposed to be provided under this Section;
 - 2. Manufacturer's specifications and other data needed to prove compliance with the specified requirements;
 - 3. Manufacturer's recommended installation procedures which, when approved by the Architect, will become the basis for accepting or rejecting actual installation procedures used on the Work.

1.4 PRODUCT HANDLING

- A. Comply with pertinent provisions of Section 016400.

PART 2 - PRODUCTS

2.1 GYPSUM WALLBOARD

- A. General: Provide products similar and equal to those manufactured by United States Gypsum Corporation as specified below or approved in advance by the Architect.

GYPSUM WALLBOARD SYSTEM

092600-1

1. Toilet Rooms, Kitchens, Janitor Area walls and ceilings (wet or humid areas): Provide "Sheetrock" brand Gypsum Moisture Resistant panels, tapered edge, 5/8" thick.
2. Corridor Walls: Provide "Sheetrock" brand Firecode Gypsum panels, tapered edge, thickness as specified in wall assembly design. NOT USED IN THIS WORK.
3. Other interior walls: Provide "Sheetrock" brand Gypsum panels, tapered edge, 5/8" thick.

2.2 METAL TRIM

- A. Form from zinc-coated steel not lighter than 26 gage, complying with Fed Spec QQ-S-775, type I, class d or e.

2.3 JOINTING SYSTEM

- A. Provide a jointing system, including reinforcing tape and compound, designed as a system to be used together and as recommended for use by the manufacturer of the gypsum wallboard approved for use on this Work.
- B. Jointing compound may be used for finishing if so recommended by its manufacturer.

2.4. FASTENING DEVICES

- A. For fastening interior wallboard and sheathing board in place use 1-1/8" type S or S-12 bugle head screws.

2.5 CEILING SUSPENSION SYSTEM

(this system not used here)

- A. Steel Channels:

1. Comply with ASTM A109 or ASTM A303.
2. Hot-rolled or cold-rolled channels for framing: Use galvanized.
3. Cold-rolled channels: Provide flanges not less than 7/16" wide.
4. Provide channels with minimum weights as follows:

Hot-rolled steel:		Cold-rolled steel:
Nominal size:	Lbs per foot:	Lbs per foot:
1-1/2"	1.120	0.475
1"	0.410	-----
3/4"	0.300	0.300

- B. Hangers supporting runner channels:

1. Provide soft annealed steel wire not smaller than 8 gage and complying with Fed Spec QQ-W-461, galvanized.
2. Flat iron or steel straps at least 3/32" x 7/8" size, galvanized or coated with rust-inhibitive paint, may be used in lieu of the specified hanger wire.

2.6 METAL CEILING AND WALL FURRING

- A. Ceiling furring channels shall be 7/8" x 2 9/16" roll formed, hat shaped section of 25 gage galvanized steel. Tie material for channels - 18 ga. wire.

2.7 METAL STUDS - AT NEW INTERIOR WALLS

- A. Unless noted otherwise in Section 092216-Metal Stud Systems, provide 20 gauge, galvanized metal "C" studs with tracks and accessories, 33ksi yield strength, complying with the requirements of AISI Specifications for the Design of Cold-Formed Steel Structural Members. Double studs around all wall openings, unless noted otherwise.

2.8 OTHER MATERIALS

- A. Provide other materials not specifically described but required for a complete and proper installation, as selected by the Contractor subject to the approval of the Architect.

PART 3 - EXECUTION

3.1 SURFACE CONDITIONS

- A. Examine the areas and conditions under which work of this Section will be performed. Correct conditions detrimental to timely and proper completion of the Work. Do not proceed until unsatisfactory conditions are corrected.

3.2 INSTALLATION

- A. General:
 - 1. Install wallboard and cement board in accordance with the Drawings with the separate boards in moderate contact but not forced into place.
 - 2. At internal corners, conceal the cut edges of the boards by the overlapping covered edges of the abutting boards.
 - 3. Stagger the boards so that corners of any four boards will not meet at a common point except in vertical corners.
- B. Walls:
 - 1. Install wallboard at right angles to the furring or framing members.
 - 2. Make end joints, where required, over framing or furring members.
 - 3. Install furring at masonry walls vertically, unless noted otherwise elsewhere.
- C. Attaching:
 - 1. Drive the specified screws with clutch-controlled power screwdrivers, spacing the screws 8" on centers.

D. Ceilings and soffits:

1. Install wallboard at right angles to the furring or framing members.
2. Make end joints, where required, over framing or furring members.
3. Space hanger wires at maximum 48" o.c. saddle tied to carrying channels spaced at 48" o.c. Space furring channels at 16" o.c. and either clip attach or wire tie to carrying channels.

E. Attaching:

1. Attach wallboard to furring channels with the specified screws spaced at 6" o.c.

3.3 JOINT TREATMENT

A. General:

1. Inspect areas to be joint treated, verifying that the gypsum wallboard fits snugly against supporting framework.
2. In areas where joint treatment and compound finishing will be performed, maintain a temperature of not less than 55 degrees for 24 hours prior to commencing the treatment and until joint and finishing compounds have dried.
3. Apply the joint treatment and finishes as required and described above.
4. Provide a minimum drying time of 24 hours between coats, with additional drying time in poorly ventilated areas.

3.4 METAL TRIM

A. General:

1. The Drawings do not purport to show all locations and requirements for metal trim.
2. Carefully study the Drawings and the installation, and provide all metal trim normally recommended by the manufacturer of the gypsum wallboard approved for use in this Work.

3.5 FINISHING

- A. Provide Level 5 finish to all gypsum board installations.

3.6 CLEANING UP

- A. In addition to other requirements for cleaning, use necessary care to prevent scattering gypsum wallboard scraps and dust, and to prevent tracking gypsum and joint finishing compound onto floor surfaces.
- B. At completion of each segment of installation in a room or space, promptly pick up and remove from the working area all scrap, debris, and surplus material of this Section.

END OF SECTION

SECTION 093100
DECORATIVE TILE

PART 1 - GENERAL

1.1 DESCRIPTION

- A. Work included: Provide hard tile where shown on the Drawings, as specified herein, and as needed for a complete and proper installation.
- B. Related work:
 - 1. Documents affecting work of this Section include, but are not necessarily limited to, General Conditions, Supplementary Conditions, and Sections in Division 1 of these Specifications.
 - 2. Section 09260: Gypsum Wallboard System

1.2 QUALITY ASSURANCE

- A. Use adequate numbers of skilled workmen who are thoroughly trained and experienced in the necessary crafts and who are completely familiar with the specified requirements and the methods needed for proper performance of the work of this Section.

1.3 SUBMITTALS

- A. Comply with pertinent provisions of Section 01340.
- B. Product data: Within 15 calendar days after the Contractor has received the Owner's Notice to Proceed, submit:
 - 1. Materials list of items proposed to be provided under this Section.
 - 2. Manufacturers' specifications and other data needed to prove compliance with the specified requirements.
 - 3. Samples of each type, class, and color of ceramic tile required, not less than 12" square, mounted on plywood or hardboard backing, and grouted as specified.

1.4 PRODUCT HANDLING

- A. Comply with pertinent provisions of Section 01640.

PART 2 - PRODUCTS

2.1 TILE

- A. Provide tile and accessories complying with Tile Council of America Specification in colors and patterns as selected by the Architect.
- B. Walls: Provide high definition porcelain glazed dimensional wall tile, 9mm thick 24" x 12" tiles – Aventis HDP Concrete Jungle line as manufactured by Florida Tile. Provide as specified or approved equal.

- C. Base: Cut wall tile to create 6" tall x 24" long pieces.
- D. Provide grout cant at base of wall, junction of wall tile and floor.
- E. Extra Stock: provide extra stock of each tile color to the owner at the end of the project. The amount of extra stock shall equal 4% of the quantity of each product provided.

2.2 SETTING MATERIALS

- A. Comply with pertinent recommendations contained in the Tile Council of America "Handbook for Ceramic Tile Installation".
- B. Latex-Portland Cement Mortar: Comply with ANSI A118.1.
- C. Acrylic Mortar Admix: Comply with ANSI A118.4
- D. Acceptable Manufacturers:
 - 1. Custom Building Products Master-Blend Thinset Mortar and Custom-Flex Thin-set Additive.
 - 2. Products of other manufacturers when approved in advance by the Architect.

2.3 GROUT

- A. Comply with pertinent recommendations contained in the Tile Council of America "Handbook for Ceramic Tile Installation" in colors selected by the Architect from standard colors available from the approved manufacturers.
- B. Latex-portland cement grout: Provide a commercially prepared mixture compatible with the setting material used. Laticrete Permacolor Select color with sanded base.
- C. Acceptable Manufacturers:
 - 1. Laticrete International, Inc. Colored Tile Grout.
 - 2. Products of other manufacturers when approved in advance by the Architect.

2.4 OTHER MATERIALS

- A. Provide other materials, not specifically described but required for a complete and proper installation, as selected by the Contractor subject to the approval of the Architect.

PART 3 - EXECUTION

3.1 SURFACE CONDITIONS

- A. Examine the areas and conditions under which work of this Section will be performed. Correct conditions detrimental to timely and proper completion of the Work. Do not proceed until unsatisfactory conditions are corrected.

3.2 INSTALLATION

A. General:

1. Comply with ANSI A108.1, ANSI A108.2, and the "Handbook for Ceramic Tile Installation" of the Tile Council of America, except as otherwise directed by the Architect or specified herein.
2. Maintain minimum temperature limits and installation practices recommended by materials manufacturers.
3. Install tile in conformance with Systems F-113-03 at typical floors and W-244-03 at typical walls. At shower floors use System F121-03 with max 2" deep mortar bed sloping to drain. At showers use System F415-03 at walls.

B. Limits of tile:

1. Extend tile into recesses and under equipment and fixtures to form a complete covering without interruptions.
2. Terminate tile neatly at obstructions, edges, and corners, without disruption of pattern or joint alignment.
3. Fit tile to electrical outlets, piping, fixtures and other penetrations so that plates, collars or covers overlap tile.

C. Joining pattern:

1. Lay tile in grid pattern unless otherwise indicated on the Drawings or directed by the Architect.
2. Align joints when adjoining tiles on floor, base, trim, and walls are the same size.
3. Layout tile work, and center the tile fields both directions in each space or on each wall area.
4. Adjust to minimize tile cutting.
5. Provide uniform joint widths.

D. Cleaning:

1. Upon completion of placing and grouting, clean the work of this Section in accordance with recommendations of the manufacturers of the materials used.
2. Protect metal surfaces, cast iron, and vitreous items from effects of acid cleaning.
3. Flush surfaces with clean water before and after cleaning.

E. Provide tile surfaces clean and free from cracked, broken, chipped, unbonded, and otherwise defective units.

F. Provide required protection of tile surfaces to prevent damage and wear prior to acceptance of the Work by the Owner.

END OF SECTION

SECTION 095100

ACOUSTICAL CEILINGS

PART 1 - GENERAL

1.1 DESCRIPTION

- A. Work included: Provide acoustical ceilings where shown on the Drawings, as specified herein, and as needed for a complete and proper installation.
- B. Related work:
 - 1. Documents affecting work of this Section include, but are not necessarily limited to, General Conditions, Supplementary Conditions, and Sections in Division I of these Specifications.

1.2 QUALITY ASSURANCE

- A. Use adequate numbers of skilled workmen who are thoroughly trained and experienced in the necessary crafts and who are completely familiar with the specified requirements and the methods needed for proper performance of the work of this Section.

1.3 PRODUCT HANDLING

- A. Comply with pertinent provisions of Section 016400.

PART 2 - PRODUCTS

2.1 EXPOSED "T" SYSTEM

- A. Provide a complete system of supporting members, anchors, wall cornices, adapters for light fixtures and grilles, and accessories of every type required for a complete suspended "T" grid system of the arrangements shown on the Drawings. Provide color or colors selected by the Architect from standard colors of the approved manufacturer, complying with pertinent requirements of Underwriters Laboratories, Inc., and the governmental agencies having jurisdiction.
- B. Acceptable products:
 - 1. Type 1 Ceiling: Armstrong "Prelude" 15/16" exposed tee suspension system. Color: White.
 - 2. Type 2 Ceiling: Armstrong "Prelude" 15/16" exposed tee suspension system. Color: White.
 - 3. Type 3 Ceiling: Armstrong "Prelude" 15/16" exposed tee suspension system. Color: White.
 - 4. Equal products of other manufacturers when approved in advance by the Architect.

2.2 ACOUSTICAL CEILING PANELS

- A. Acceptable products:
 - 1. Type 1 Tile: Armstrong "Fine Fissured", Item No. 1729A, square lay-in 15/16", 24" x 24" x 5/8" panel. Color: White.

2. Type 2 Tile: Armstrong "Cirrus High NRC", Item No. 558, angled tegular edge, 24"x24"x7/8" panel. Color: White. NRC .75.
3. Type 3 Tile: Armstrong "Kitchen Zone", Item No. 672, square edge, 24"x24"x5/8" panel. Color: White. CAC (sound blocking)= 33.
4. Equal products of other manufacturers if approved in advance by the Architect.

2.3 OTHER MATERIALS

- A. Provide other materials, not specifically described but required for a complete and proper installation, as selected by the Contractor subject to the approval of the Architect.

PART 3 - EXECUTION

3.1 SURFACE CONDITIONS

- A. Examine the areas and conditions under which work of this Section will be performed. Correct conditions detrimental to timely and proper completion of the Work. Do not proceed until unsatisfactory conditions are corrected.

3.2 INSTALLATION, GENERAL

- A. Except as modified by requirements of governmental agencies having jurisdiction, install suspended ceiling systems in accordance with the recommendations of the manufacturer as approved by the Architect.
- B. Lateral bracing:
 1. Provide lateral bracing as required by pertinent codes and regulations.
 2. Secure lateral bracing to structural members. Secure at right angles to the direction of the partition and four ways in large ceiling areas.
- C. Make all grid level within a tolerance of one in 1000 and straight within a tolerance of one in 1000.

3.3 INSTALLATION OF ACOUSTICAL MATERIALS

- A. "T" grid system: Install acoustical ceiling boards so linearity of facing is in the same direction.

3.4 CLEANING UP

- A. In addition to other stipulated requirements for cleaning, completely remove finger prints and traces of soil from the surfaces of grid and acoustical materials, using only those cleaning materials recommended for the purpose by the manufacturer of the material being cleaned.

END OF SECTION

RESILIENT TILE FLOORING

SECTION 096500

PART 1 - GENERAL

1.1 DESCRIPTION

- A. Work included: Provide resilient tile flooring and base where shown on the Drawings, as specified herein, and as needed for a complete and proper installation.
- B. Related work:
 - 1. Documents affecting work of this Section include, but are not necessarily limited to, General Conditions, Supplementary Conditions, and Sections in Division I of these Specifications.
 - 2. Section 03300: Cast-in-Place Concrete.

1.2 QUALITY ASSURANCE

- A. Use adequate numbers of skilled workmen who are thoroughly trained and experienced in the necessary crafts and who are completely familiar with the specified requirements and the methods needed for proper performance of the work of this Section.

1.3 SUBMITTALS

- A. Comply with pertinent provisions of Section 01340.
- B. Product data: Within 35 calendar days after the Contractor has received the Owner's Notice to Proceed, submit:
 - 1. Materials list of items proposed to be provided under this Section;
 - 2. Manufacturer's specifications and other data needed to prove compliance with the specified requirements;
 - 3. Samples of each item, color, and pattern available in the specified grades from the proposed manufacturers.
 - 4. Manufacturer's recommended installation procedures which, when approved by the Architect, will become the basis for accepting or rejecting actual installation procedures used on the Work.

1.4 PRODUCT HANDLING

- A. Comply with pertinent provisions of Section 01640.

PART 2 - PRODUCTS

2.1 MATERIALS, GENERAL

- A. Provide colors and patterns as selected by the Architect from standard colors and patterns of the approved manufacturer in the specified type.
- B. Adhesives:
 - 1. Provide waterproof and stabilized type adhesive as recommended by the manufacturer of the material being installed.

2. Asphalt emulsions and other non-waterproof adhesives will not be acceptable.
- C. Concrete slab primer: Provide non-staining type as required and as recommended by the manufacturer of the material being installed.

2.2 RESILIENT MATERIALS

(no tiles used on project - only wall base)

- A. Solid vinyl tile:
 1. Dimension: Provide 12" x 12" x 1/8".
 2. Acceptable products:
 - a. Use Armstrong Flooring/ Standard Excelon Imperial Texture as price basis.
- B. Equal products of other manufacturers when approved in advance by the Architect.
- C. Rubber base:
 1. Where shown or called for in the Drawings, provide 4" high, topset cove base as manufactured by Johnsonite or equal product when approved in advance by the Architect.
- D. Accessories:
 1. At the centerline of door openings, provide vinyl feature strips matching the width of the door frame.
 2. At the junction of vinyl tile flooring and concrete finish flooring, provide tile reducing strips.

2.3 OTHER MATERIALS

- A. Provide other materials, not specifically described but required for a complete and proper installation, as selected by the Contractor subject to the approval of the Architect.

PART 3 - EXECUTION

3.1 SURFACE CONDITIONS

- A. Examine the areas and conditions under which work of this Section will be performed. Correct conditions detrimental to timely and proper completion of the Work. Do not proceed until unsatisfactory conditions are corrected.

3.2 PREPARATION

- A. Subfloors:
 1. Verify that substrate is smooth, level, at required finish elevation, and without more than 1/8" in 10'-0" variation from level or slopes shown on the Drawings.
 2. Prior to laying materials, broom clean or vacuum the surfaces to be covered, and inspect the subfloors. Uneven finish surface due to foreign matter beneath tiles shall not be tolerated.
 3. Patch, fill with leveling compound, grind down or otherwise prepare irregular subfloor surfaces to the degree of level called for above.

B. Priming:

1. Apply concrete slab primer if so recommended by the resilient flooring manufacturer.
2. Apply in accordance with the manufacturer's recommendations as approved by the Architect.

3.3 INSTALLATION

A. General:

1. Install materials only after finishing operations, including painting, have been completed and after permanent heating system is operating.
2. Verify that moisture content of concrete slabs, building air temperature, and relative humidity are within the limits recommended by the manufacturers of the materials used.
3. Maintain reference markers, holes, and openings that are in place or plainly marked for future cutting by repeating on the finish surface as marked in the subfloor. Use chalk or other non-permanent marking device.

B. Installing resilient tiles:

1. Place units with adhesive cement in strict compliance with the manufacturer's recommendations as approved by the Architect.
 - a. Butt units tightly to vertical surfaces, nosings, edgings, and thresholds.
 - b. Scribe as necessary around obstructions and to produce neat joints.
 - c. Place tiles tightly laid, even, and in straight parallel lines.
 - d. Extend units into toe spaces, door reveals, and in closets and similar spaces.
2. Lay units from center marks established with principal walls, discounting minor offsets, so that units at opposite edges of the room are of equal width.
 - a. Adjust as necessary to avoid use of cut widths less than 3" wide at room perimeters.
 - b. Lay units square to axes of the room or space.
3. Match units for color and pattern by using materials from cartons in the same sequence as manufactured and packaged.
4. Lay in checker board pattern with grain units running in opposite direction, unless otherwise directed by the Architect.
5. Place tile reducing strips tightly butted to units and secured with adhesive, providing at all unprotected edges unless otherwise shown.
6. Provide and install accent strips under all door thresholds. Color as selected by Architect

C. Installing base:

1. Install base where called for in the Drawings.
2. Use factory-preformed exterior corners, and factory-preformed or job-mitered interior corners.

D. Finishing:

1. Provide floor waxing of all flooring of this section. Provide minimum 3 coats.

3.4 CLEANING AND PROTECTING

- A. Remove excess adhesive and other blemishes from exposed surfaces, using neutral cleaner recommended by the manufacturer of the resilient materials.

END OF SECTION

SECTION 096813

CARPETING

PART 1 - GENERAL

1.1 DESCRIPTION

- A. Work included: Provide carpeting and carpet accessories where shown on the Drawings, as specified herein, and as needed for a complete and proper installation.
- B. Related work:
 - 1. Documents affecting work of this Section include, but are not necessarily limited to, General Conditions, Supplementary Conditions, and Sections in Division I of these Specifications.

1.2 QUALITY ASSURANCE

- A. Use adequate numbers of skilled workmen who are thoroughly trained and experienced in the necessary crafts and who are completely familiar with the specified requirements and the methods needed for proper performance of the work of this Section.
- B. Installers shall have a minimum of five years experience in the installation of the specified carpeting materials on projects of similar size and scope.

1.3 SUBMITTALS

- A. Comply with pertinent provisions of Section 01340.
- B. Product data: Within 30 calendar days after the Contractor has received the Owner's Notice to Proceed, submit:
 - 1. Materials list of items proposed to be provided under this Section;
 - 2. Manufacturer's specifications and other data needed to prove compliance with the specified requirements;
 - 3. Samples (not pictures) of the full range of colors and patterns of carpet and of exposed accessories available from the proposed manufacturers in the specified qualities.
 - 4. Manufacturer's recommended installation procedures which, when approved by the Architect, will become the basis for accepting or rejecting actual installation procedures used on the Work.
- C. After the Architect has selected the color and pattern, submit three Samples of each specified color and pattern from the stock proposed to be installed. Secure the Architect's approval of these Samples prior to installation.

1.4 PRODUCT HANDLING

- A. Comply with pertinent provisions of Section 01640.

1.5 WARRANTIES

- A. Provide manufacturer's lifetime commercial limited warranty covering the fiber from abrasive wear (that the carpet will not lose more than 10% pile face fiber), stain (against acid base

substances), colorfastness (no significant change in color), static protection (prevents electrostatic buildup); and covering the backing for tuft bind (superior tuft bind in high traffic environments), edge ravel, and integrity/delamination (secondary backing will not delaminate). Provide 10 year limited stain resistance warranty.

PART 2 - PRODUCTS

2.1 CARPET

- A. Provide commercial premium fiber branded ECO solution dyed nylon carpet tiles – 24" x 24", gauge: 1/12, minimum 11.0 stitches per inch, multi-level patterned loop, primary backing: conductive non-woven synthetic. Provide carpet from Julie Industries, Static Smart, Colonial Series carpet tiles or approved equal. Install quarter turn.
- B. Extra Stock: provide extra stock of each tile color to the owner at the end of the project. The amount of extra stock shall equal 4% of the quantity of each product provided.

2.2 BASE

- A. Provide rubber base 4" high, topset cove base as manufactured by Burke or equal product when approved in advance by the Architect.

2.3 OTHER MATERIALS

- A. Adhesives:
 - 1. Provide conductive releasable adhesive supplied by access floor manufacturer.
- B. Resilient carpet transition reducer at carpet perimeters transitioning to other flooring material. Gauge thickness with wheelchair access in mind.
- C. Provide other materials, not specifically described but required for a complete and proper installation, as selected by the Contractor subject to the approval of the Architect.

PART 3 - EXECUTION

3.1 SURFACE CONDITIONS

- A. Examine the areas and conditions under which work of this Section will be performed. Correct conditions detrimental to timely and proper completion of the Work. Do not proceed until unsatisfactory conditions are corrected.

3.2 SURFACE PREPARATION

- A. Immediately prior to installation of the work of this Section, thoroughly clean substrata and remove oil, grease, paint, varnish, hardeners, and other items which would adversely affect the bond of adhesive.
- B. Make substrata level and free from irregularities. Assure one constant floor height after carpet is installed, filling low spots and grinding high spots as required.

3.3 INSTALLATION

- A. Install carpet in direct glue down fashion in quarter turn arrangement. Install only in conditioned space. Install carpet as late as practical in the schedule of the overall project.

Provide resilient transition strip material at carpet perimeter flooring change from carpet to other flooring.

B. Base:

1. Install base materials where called for in the Drawings and as required by the manufacturer's installation literature.

C. In addition to the cleaning requirements stated elsewhere, thoroughly clean carpet and adjacent surfaces prior to final acceptance of the carpeted areas by the Owner.

3.4 PROTECTION

- A. Provide a heavy non-staining paper or plastic walkway as required over carpeting in direction of traffic, maintaining intact until carpeted space is accepted by the Owner. Provide product equal to Ram Board 46 mil paperboard in access walkways throughout the work area to protect carpet in place. Provide as required to protect the carpet and when directed by the architect.

END OF SECTION

SECTION 099000

PAINTING

PART 1 - GENERAL

1.1 DESCRIPTION

- A. Work included: Paint and finish the exterior and interior exposed surfaces listed on the Painting Schedule in Part 3 of this Section, as specified herein, and as needed for a complete and proper installation.
- B. Related work:
 - 1. Documents affecting work of this Section include, but are not necessarily limited to, General Conditions and Sections in Division I of these Specifications.
 - 2. Priming or priming and finishing of certain surfaces may be specified to be factory-performed or installer-performed under pertinent other Sections.
 - 3. Section 08211: Wood Doors
 - 4. Section 09260: Gypsum Wallboard Systems
- C. Work not included:
 - 1. Unless otherwise indicated, painting is not required on surfaces in concealed areas and inaccessible areas such as furred spaces, foundation spaces, utility tunnels, pipe spaces, and duct shafts.
 - 2. Metal surfaces of anodized aluminum, stainless steel, chromium plate, copper, bronze, and similar finished materials will not require painting under this Section except as may be so specified.
 - 3. Do not paint moving parts of operating units; mechanical or electrical parts such as valve operators; linkages; sensing devices; fire sprinkler heads and motor shafts, unless otherwise indicated.
 - 4. Do not paint over required labels or equipment identification, performance rating, name, or nomenclature plates.
- D. Definitions:
 - 1. "Paint," as used herein, means coating systems materials including primers, emulsions, epoxy, enamels, sealers, fillers, and other applied materials whether used as prime, intermediate, or finish coats.

1.2 QUALITY ASSURANCE

- A. Use adequate numbers of skilled workmen who are thoroughly trained and experienced in the necessary crafts and who are completely familiar with the specified requirements and the methods needed for proper performance of the work of this Section.
- B. Paint coordination:
 - 1. Provide finish coats that are compatible with the prime coats actually used.
 - 2. Review other Sections of these Specifications as required, verifying the prime coats to be used and assuring compatibility of the total coating system for the

- various substrata.
3. Upon request, furnish information on the characteristics of the specific finish materials to assure that compatible prime coats are used.
 4. Provide barrier coats over incompatible primers, or remove the primer and reprime as required.
 5. Notify the Architect in writing of anticipated problems in using the specified coating systems over prime coatings supplied under other Sections.

1.3 SUBMITTALS

- A. Comply with pertinent provisions of Section 01340.
- B. Product data: Within 15 calendar days after the Contractor has received the Owner's Notice to Proceed, submit:
 1. Materials list of items proposed to be provided under this Section;
 2. Manufacturer's specifications and other data need to prove compliance with the specified requirements.
- C. Samples:
 1. Following the selection of colors and glosses by the Architect, as described under "Color Schedules" in Part 2 of this Section, submit Samples for the Architect's review.
 - a. Provide two Samples of each color and each gloss for each material on which the finish is specified to be applied.
 - b. Except as otherwise directed by the Architect, make Samples approximately 8" x 10" in size.
 - c. If so directed by the Architect, submit Samples during progress of the Work in the form of actual application of the approved materials on actual surfaces to be painted.
 2. Revise and resubmit each Sample as requested until the required gloss, color, and texture is achieved. Such Samples, when approved, will become standards of color and finish for accepting or rejecting the work of this Section.
 3. Do not commence finish painting until approved Samples are on file at the job site.

1.4 CLOSEOUT SUBMITTALS

- A. Coating Maintenance Manual: Provide coating maintenance manual including area summary with finish schedule, area detail designating location where each product/color/finish was used, product data pages, material safety data sheets, care and cleaning instructions, and color samples of each color and finish used.

1.5 PRODUCT HANDLING

- A. Comply with pertinent provisions of Section 01640.

1.6 JOB CONDITIONS

- A. Do not apply solvent-thinned paints when the temperature of surfaces to be painted and the surrounding air temperatures are below 45 degrees F, unless otherwise permitted by the manufacturers' printed instructions as approved by the Architect.
- B. Weather conditions:
 - 1. Do not apply paint in rain, fog, or mist; or when the relative humidity exceeds 85%; or to damp or wet surfaces, unless otherwise permitted by the manufacturers' printed instructions as approved by the Architect.
 - 2. Applications may be continued during inclement weather only within the temperature limits specified by the paint manufacturer as being suitable for use during application and drying periods.

PART 2 - PRODUCTS

2.1 PAINT MATERIALS

- A. Acceptable materials and suppliers:
 - 1. The Painting Schedule in Part 3 of this Section is based on products of Sherwin Williams Company, unless noted otherwise.
 - 2. Basis of design uses paint products as manufactured by Sherwin Williams Company, or equal approved in advance by architect.
- B. Undercoats and thinners:
 - 1. Provide undercoat paint produced by the same manufacturer as the finish coat.
 - 2. Use only the thinners recommended by the paint manufacturer, and use only to the recommended limits.
 - 3. Insofar as practicable, use undercoat, finish coat, and thinner material as parts of a unified system of paint finish.

2.2 COLOR SCHEDULES

- A. The Architect will prepare a color schedule with samples for guidance in painting.
- B. The Architect may select, allocate, and vary colors on different surfaces throughout the Work.

2.3 APPLICATION EQUIPMENT

- A. For application of the approved paint, use only such equipment as is recommended for application of the particular paint by the manufacturer of the particular paint, and as approved by the Architect.
- B. Prior to use of application equipment, verify that the proposed equipment is actually compatible with the material to be applied, and that integrity of the finish will not be jeopardized by use of the proposed equipment.

2.4 OTHER MATERIALS

- A. Provide other materials not specifically described but required for a complete and proper installation, as selected by the Contractor subject to the approval of the Architect.

PART 3 - EXECUTION

3.1 SURFACE CONDITIONS

- A. Examine the areas and conditions under which work of this Section will be performed. Correct conditions detrimental to timely and proper completion of the Work. Do not proceed until unsatisfactory conditions are corrected.

3.2 MATERIALS PREPARATION

- A. General:
 - 1. Mix and prepare paint materials in strict accordance with the manufacturers' recommendations as approved by the Architect.
 - 2. When materials are not in use, store in tightly covered containers.
 - 3. Maintain containers used in storage, mixing, and application of paint in a clean condition, free from foreign materials and residue.
- B. Stirring:
 - 1. Stir materials before application, producing a mixture of uniform density.
 - 2. Do not stir into the material any film that may form on the surface, but remove the film and, if necessary, strain the material before using.

3.3 SURFACE PREPARATION

- A. General:
 - 1. Perform preparation and cleaning procedures in strict accordance with the paint manufacturers' recommendations as approved by the Architect.
 - 1. Examine any existing painted surfaces whether oil based or latex based and prepare surfaces accordingly. Surface preparation of existing oil based paint surfaces includes at minimum scuff sanding any glossy areas, removing any loose or flaking paint, and cleaning all the dirt and contaminants off the surface.
 - 3. Remove removable items that are in place and are not scheduled to receive paint finish; or provide surface-applied protection prior to surface preparation and painting operations.
 - 4. Following completion of painting in each space or area, reinstall the removed items by using workmen who are skilled in the necessary trades.
 - 5. Clean each surface to be painted prior to applying paint or surface treatment.
 - 6. Remove oil and grease with clean cloths and cleaning solvent of low toxicity and flash point in excess of 200 degrees F, prior to start of mechanical cleaning.
 - 7. Schedule the cleaning and painting so that dust and other contaminants from the cleaning process will not fall onto wet newly painted surfaces.
- B. Preparation of wood and fiber cement surfaces:

1. Clean surfaces until free from dirt, oil, and other foreign substance.
2. Smooth finished surfaces exposed to view, using the proper sandpaper. Where so required, use varying degrees of coarseness in sandpaper to produce a uniformly smooth and unmarred surface.
3. On existing exposed surfaces, scrape, remove all loose material, sand and prepare for paint.
4. Unless specifically approved by the Architect, do not proceed with painting of wood surfaces until the moisture content of the wood is 12% or less as measured by a moisture meter approved by the Architect.

C. Preparation of metal surfaces:

1. Thoroughly clean surfaces until free from dirt, oil, and grease.
2. On galvanized surfaces, use solvent for the initial cleaning and then treat the surface thoroughly with phosphoric acid etch. Remove etching solution completely before proceeding.
3. Allow surfaces to dry completely before application of paint.
4. On existing metal surfaces scheduled to be repainted, remove rust, loose paint and dirt. Sand rusted areas to bare metal.

D. Preparation of concrete and masonry surfaces:

1. Thoroughly clean surfaces until free from dirt, oil, and grease.
2. On existing exposed surfaces, scrape, remove all loose material, sand and prepare for paint. Remove all glossy finish on existing floors by sanding.
3. Use block filler primer on all c.m.u. to be painted.

3.4 PAINT APPLICATION

A. General:

1. Touchup shop-applied prime coats which have been damaged, and touchup bare areas prior to start of finish coats application.
2. Slightly vary the color of succeeding coats.
 - a. Do not apply additional coats until the completed coat has been inspected and approved.
 - b. Only the inspected and approved coats of paint will be considered in determining the number of coats applied.
3. Sand and dust between coats to remove defects visible to the unaided eye from a distance of five feet.
4. On removable panels and hinged panels, paint the back sides to match the exposed sides.

B. Drying:

1. Allow sufficient drying time between coats, modifying the period as recommended by the material manufacturer to suit adverse weather conditions.
2. Consider oil-base solvent-type paint as dry for recoating when the paint feels firm, does not deform or feel sticky under moderate pressure of the thumb, and when the application of another coat of paint does not cause lifting or loss of adhesion of the undercoat.

C. Brush applications:

1. Brush out and work the brush coats onto the surface in an even film.
2. Cloudiness, spotting, holidays, laps, brush marks, runs, sags, ropiness, and other surface imperfections will not be acceptable.

D. Spray application:

1. Except as specifically otherwise approved by the Architect, confine spray application to metal framework and similar surfaces where hand brushwork would be inferior.
2. Where spray application is used, apply each coat to provide the hiding equivalent of brush coats.
3. Do not double back with spray equipment to build up film thickness of two coats in one pass.
4. If spray application is allowed by the Architect, thorough preparation of the existing substrate and removal of all surface dust and sanding dust shall be performed.

E. For completed work, match the approved Samples as to texture, color, and coverage. Remove, refinish, or repaint work not in compliance with the specified requirements.

F. Miscellaneous surfaces and procedures:

1. Exposed mechanical items:
 - a. Finish access doors, conduits, pipes, ducts, grilles, registers, vents, and items of similar nature to match the adjacent wall and ceiling surfaces, or as directed.

3.5 PAINTING SCHEDULE

Provide the following paint finishes.

A. Interior Gypsum Board Walls:
(Typical walls and ceiling furr-downs)

- | | | |
|----|--------------|--|
| 1. | First Coat: | High Build Interior Latex Primer |
| 2. | Second Coat: | ProMar 200 Zero VOC Interior Latex Low Sheen
Eg-Shel finish |
| 3. | Third Coat: | Same as second coat |

B. Interior Gypsum Board Walls:
(Restrooms, Kitchens, and Kitchenettes)

- | | | |
|----|--------------|--|
| 1. | First Coat: | High Build Interior Latex Primer |
| 2. | Second Coat: | ProMar 200 Zero VOC Interior Latex Eg-Shel |
| 3. | Third Coat: | Same as second coat |

- C. Interior Wood Trim called out for painting:
1. First Coat: PrepRite ProBlock Interior/Exterior Latex Primer/Sealer
 2. Second Coat: Multi Surface Acrylic
 3. Third Coat: Same as second coat
- D. Interior Woodwork (called out for staining) and Wood Doors:
1. First Coat: Minwax Pre-Stain Wood Conditioner Oil Based
 2. Second Coat: Minwax Performance Series Tintable Interior Stain
 3. Third Coat: Minwax Performance Series Fast-Dry Varnish
 4. Fourth Coat: Same as third coat
- E. Interior Metal:
1. First Coat: Kem Kromik Universal Metal Primer
 2. Second Coat: Pro Industrial DTM Acrylic Semi-gloss
 3. Third Coat: Same as second coat
- F. Interior Metal (Factory Primed):
1. First Coat: Pro Industrial DTM Acrylic Semi-gloss
 2. Second Coat: Same as second coat
- G. Interior Concrete Masonry Units:
1. First Coat: Loxon Acrylic Block Surfer
 2. Second Coat: Multi Surface Acrylic
 3. Third Coat: Same as second coat
- H. Exterior Metal:
1. First Coat: Kem Kromik Universal Metal Primer
 2. Second Coat: Pro Industrial DTM Acrylic Semi-gloss
 3. Third Coat: Same as second coat
- I. Exterior Metal (Factory Primed):
1. First Coat: Pro Industrial DTM Acrylic Semi-gloss
 2. Second Coat: Same as second coat
- H. Exterior Concrete Masonry Units:
1. First Coat: Loxon Acrylic Block Surfer
 2. Second Coat: ConFlex Acrylic Coating
 3. Third Coat: Same as second coat

END OF SECTION

**DIVISION 10
SPECIALTIES**

SECTION 101400
IDENTIFYING DEVICES

PART 1 - GENERAL

1.1 DESCRIPTION

- A. Work included: Provide identifying devices as specified herein and as needed for a complete and proper installation including, but not necessarily limited to:
 - 1. Interior Door/Room Signs and Exterior Wall Signs.
- B. Related work:
 - 1. Documents affecting work of this Section include, but are not necessarily limited to, General Conditions, Supplementary Conditions, and Sections in Division I of these Specifications.

1.2 QUALITY ASSURANCE

- A. Use adequate numbers of skilled workmen who are thoroughly trained and experienced in the necessary crafts and who are completely familiar with the specified requirements and the methods needed for proper performance of the work of this Section.

1.3 SUBMITTALS

- A. Comply with pertinent provisions of Section 013400.
- B. Product data: Within 60 calendar days after the Contractor has received the Owner's Notice to Proceed, submit:
 - 1. Materials list of items proposed to be provided under this Section;
 - 2. Manufacturer's specifications and other data needed to prove compliance with the specified requirements;
 - 3. Details of installation and anchorage sufficient to enable proper interface of the work of this Section with the work of other trades.
 - 4. Manufacturer's recommended installation procedures which, when approved by the Architect, will become the basis for accepting or rejecting actual installation procedures used on the Work.

1.4 PRODUCT HANDLING

- A. Comply with pertinent provisions of Section 016400.

PART 2 - PRODUCTS

2.1 APPROVED MANUFACTURERS

- A. Interior signage design is based on use of products manufactured by Best Sign Systems.
- B. Provide the products upon which design is based, or provide equal products of another

manufacturer approved in advance by the Architect. Acceptable manufacturer's include Best Sign Systems, Gemini Incorporated and Advantage Sign and Graphics, Inc.

- C. Except as otherwise approved by the Architect, provide all products of this Section from a single manufacturer

2.2 INTERIOR SIGNAGE

- A. At interior door locations, (minimum 25 locations including restrooms) provide BEST Sign Systems, HC300 ADA system, with square corner, no border, with holes and flat stainless steel screw mounting. Lettering shall be standard "medium graphic blast". Background shall be a standard "MP" color and lettering shall be a different "MP" color. All signs shall have standard braille under graphic lettering.
 - 1. Provide HC300E, 10" x 3" with room name at each interior door typical.
 - 2. Provide slotted signage at 4 offices.

2.3 EXTERIOR SIGNAGE

- A. At locations shown on the elevation Drawings at the building front entrance. Provide products from Gemini Incorporated or approved equal; cast metal, "Roman" typeface, height and case as shown on the Drawings, w/ concealed stud mounting on masonry or stucco.
 - 1. Wording shall be as shown on the Drawings.
 - 2. Colors shall be from manufacturer's standard line as selected by architect.

PART 3 - EXECUTION

3.1 SURFACE CONDITIONS

- A. Examine the areas and conditions under which work of this Section will be performed. Correct conditions detrimental to timely and proper completion of the Work. Do not proceed until unsatisfactory conditions are corrected.

3.2 INSTALLATION

- A. Install the work of this Section in strict accordance with the manufacturers' recommendations as approved by the Architect, using only the approved mounting materials, and locating all components firmly into position, level and plumb.

END OF SECTION

SECTION 102113
TOILET PARTITIONS

PART 1 - GENERAL

1.1 DESCRIPTION

- A. Work included: Provide plastic laminate faced toilet partitions where shown on the Drawings, as specified herein, and as needed for a complete and proper installation.
- B. Related work:
 - 1. Documents affecting work of this Section include, but are not necessarily limited to, General Conditions, Supplementary Conditions, and Sections in Division I of these Specifications.
 - 2. Section 042200: Concrete Unit Masonry.
 - 3. Section 108000: Toilet Room Accessories.

1.2 QUALITY ASSURANCE

- A. Use adequate numbers of skilled workmen who are thoroughly trained and experienced in the necessary crafts and who are completely familiar with the specified requirements and the methods needed for proper performance of the work of this Section.

1.3 SUBMITTALS

- A. Comply with pertinent provisions of Section 013400.
- B. Product data: Within 45 calendar days after the Contractor has received the Owner's Notice to Proceed, submit:
 - 1. Materials list of items proposed to be provided under this Section;
 - 2. Manufacturer's specifications and other data needed to prove compliance with the specified requirements;
 - 3. Shop Drawings in sufficient detail to show fabrication, installation, anchorage, and interface of the work of this Section with the work of adjacent trades;
 - 4. Color and pattern charts showing colors and patterns available in the specified products from the proposed manufacturer.
 - 5. Manufacturer's recommended installation procedures which, when approved by the Architect, will become the basis for accepting or rejecting actual installation procedures used on the Work.

1.4 PRODUCT HANDLING

- A. Comply with pertinent provisions of Section 016400.

PART 2 - PRODUCTS

2.1 PLASTIC LAMINATE FACED TOILET PARTITIONS AND SCREENS

- A. Provide laminated plastic toilet partitions, top-braced, floor mounted, in the dimensions and arrangements shown on the Drawings, and in colors and finishes selected by the Architect from standard colors and finishes of the approved manufacturer.
 - 1. Panels - High Pressure Plastic Laminate, GP-50, .050"thick. Core material shall be industrial grade 45-pound density particleboard.
 - 2. Stile Shoes and Caps: Shall be 20 gage, Type 304 stainless steel, minimum 3" high, satin (brushed) finish.
 - 3. Brackets: cast chrome plated, non-ferrous hardware.
 - 4. Overhead Bracing: continuous extruded aluminum, anti-grip profile, with clear satin anodized finish with headrail returns as required.
 - 5. Door Dimensions: Unless otherwise indicated, furnish 24" wide in-swing doors for ordinary toilet compartments and minimum 32" (clear opening) doors for compartments required to be handicap accessible.
 - 6. Hardware: shall be compliant with all accessibility requirements. Coat hooks and door pulls shall be cast chrome plated non-ferrous metal. Provide bumpers on coat hooks on in-swing doors.
- B. Provide wall hung urinal screens in the dimensions and arrangements if shown on the Drawings, and in colors and finishes selected by the Architect from standard colors and finishes of the approved manufacturer.
- C. Provide products as manufactured by Ampco Products, Inc.

2.2 OTHER MATERIALS

- A. Provide other materials, not specifically described but required for a complete and proper installation.

PART 3 - EXECUTION

3.1 SURFACE CONDITIONS

- A. Examine the areas and conditions under which work of this Section will be performed. Correct conditions detrimental to timely and proper completion of the Work. Do not proceed until unsatisfactory conditions are corrected.

3.2 INSTALLATION

- A. Coordinate as required with other trades to assure proper and adequate provision in the work of those trades for interface with the work of this section.
- B. Install the work of this section in strict accordance with the original design, the approved Shop Drawings pertinent requirements of governmental agencies having jurisdiction and the manufacturer's recommended installation procedures as approved by the Architect, anchoring all components firmly into position for long life under hard use.

- C. Adjust doors, except doors to handicapped compartments, to remain at a uniformly open position when unlocked.
- D. Touchup scratches and abrasions to be completely invisible to the unaided eye from a distance of five feet.

END OF SECTION

SECTION 102226

OPERABLE WALL PARTITIONS

PART 1 – GENERAL

1.1 DESCRIPTION

- A. Work included under this section is operable partitions, overhead hung, manual operation, paired flat panels hinged together.

1.2 SUMMARY

- A. This Section includes the following:
 - 1. Manually operated, paired panel operable partitions.
- B. Related Sections include the following:
 - 1. Division 03 Sections for concrete tolerances required.
 - 2. Division 05 Sections for primary structural support, including pre-punching of support members by structural steel supplier per operable partition supplier's template.
 - 3. Division 06 Sections for wood framing & supports, and all blocking at head and jambs as required.
 - 4. Division 09 Sections for wall and ceiling framing at head and jambs.

1.3 QUALITY ASSURANCE

- A. Installer Qualifications: An experienced installer who is certified in writing by the operable partition manufacturer, as qualified to install the manufacturer's partition systems for work similar in material, design, and extent to that indicated for this Project.
- B. Acoustical Performance: Test operable partitions in an independent acoustical laboratory in accordance with ASTM E90 test procedure and classified in accordance with ASTM E413 to attain no less than the STC rating specified. Provide a complete and unedited written test report by the testing laboratory upon request.
- C. Preparation of the opening shall conform to the criteria set forth per ASTM E557 *Standard Practice for Architectural Application and Installation of Operable Partitions*.
- D. The operable wall must be manufactured by a certified ISO-9001-2015 company or an equivalent quality control system.

1.4 REFERENCE STANDARDS

- A. ASTM International
 - 1. ASTM E557 Standard Practice for Architectural Application and Installation of Operable Partitions.
 - 2. ASTM E90 - Standard Test Method for Laboratory Measurement of Airborne Sound Transmission Loss of Building Partitions and Elements.
 - 3. ASTM C1036 - Standard Specification for Flat Glass.
 - 4. ASTM C1048 - Heat-Treated Flat Glass—Kind HS, Kind FT Coated and Uncoated Glass.
 - 5. ASTM E84 - Surface Burning Characteristics of Building Materials.
 - 6. ASTM E413 - Classification for Rating Sound Insulation
- B. Health Product Declaration Collaborative
 - 1. Health Product Declaration Open Standard v2.1
- C. International Standards Organization
 - 1. ISO 14021 - Environmental Labels and Declarations - Self-Declared Environmental Claims (Type II Environmental Labeling).
 - 2. ISO 14025:2011-10, Environmental Labels and Declarations - Type III Environmental Declarations - Principles and Procedures.
 - 3. ISO 14040:2009-11, Environmental Management - Life Cycle Assessment - Principles and Framework.

4. ISO 14044:2006-10, Environmental Management - Life Cycle Assessment - Requirements and Guidelines.
 5. ISO 21930 – Sustainability in Buildings and Civil Engineering Works — Core Rules for Environmental Product Declarations of Construction Products and Services.
- D. Other Standards
1. ADA – Americans with Disabilities Act.
 2. ANSI Z97.1 - Safety Glazing Materials Used in Buildings.
 3. CPSC 16 CFR 1201 - Safety Standard for Architectural Glazing Materials.
 4. NEMA LD3 - High Pressure Decorative Laminates.

1.5 SUBMITTALS

- A. Product Data: Material descriptions, construction details, finishes, installation details, and operating instructions for each type of operable partition, component, and accessory specified.
- B. Shop Drawings: Show location and extent of operable partitions. Include plans, elevations, sections, details, attachments to other construction, and accessories. Indicate dimensions, weights, conditions at openings, and at storage areas, and required installation, storage, and operating clearances. Indicate location and installation requirements for hardware and track, including floor tolerances required and direction of travel. Indicate blocking to be provided by others.
- C. Setting Drawings: Show imbedded items and cutouts required in other work, including support beam punching template.
- D. Samples: Color samples demonstrating full range of finishes available by architect. Verification samples will be available in same thickness and material indicated for the work.
- E. Reports: Provide a complete and unedited written sound test report indicating test specimen matches product as submitted.
- F. Create spaces that are healthy for occupants.
 1. Furnish products and materials with Health Product Declaration (HPD), Manufacturer Inventory, or other material health disclosure documentation. Products without an HPD or other disclosure documentation are not acceptable.
- G. Furnish materials that generate the least amount of pollution.
 1. Furnish products and materials that have third party verified environmental product declarations (EPD's). Consider products and materials that have optimized environmental performance (reduced life cycle impacts). Products without an EPD or other disclosure documentation are not acceptable.
- H. Buy American: Folding door to be manufactured in the United States in compliance with applicable U.S. Federal Trade Commission (FTC) and U.S. Customs Service and Border Protections regulations and be labeled "Made in America".

1.6 DELIVERY, STORAGE, AND HANDLING

- A. Clearly mark packages and panels with numbering systems used on Shop Drawings. Do not use permanent markings on panels.
- B. Protect panels during delivery, storage, and handling to comply with manufacturer's direction and as required to prevent damage.

1.7 WARRANTY

- A. Provide written warranty by manufacturer of operable partitions agreeing to repair or replace any components with manufacturing defects.
- B. Warranty period: Two (2) years.
- C. Suspension System Warranty:
 1. OP-01: Five (5) years.

PART 2 – PRODUCTS

2.1 MANUFACTURERS, PRODUCTS, AND OPERATION

- A. Manufacturers: Subject to compliance with requirements, provide product by the following:
 1. Modernfold, Inc.

- B. Doors to be manufactured in the U.S.A.
- C. Products: Subject to compliance with the requirements, provide the following product:
 - 1. OP-01: Acousti-Seal Legacy - Paired Panel: Manually operated paired panel operable partition.

2.2 OPERATION

- A. OP-01: Acousti-Seal Legacy - Paired Panel: Series of paired flat panels hinged together in pairs, manually operated, top supported with operable floor seals.
- B. Final Closure:
 - 1. OP-01: Horizontally expanding panel edge with removable crank

2.3 PANEL CONSTRUCTION

- A. OP-01: Nominal 3-inch (76mm) thick panels in manufacturer's standard 48-inch (1220mm) widths. All panel horizontal and vertical framing members fabricated from minimum 16-gage formed steel with overlapped and welded corners for rigidity. Top channel is reinforced to support suspension system components. Frame is designed so that full vertical edges of panels are of formed steel and provide concealed protection of the edges of the panel skin.
- B. Panel skin shall be:
 - 1. OP-01: Roll-formed steel wrapping around panel edge. Panel skins shall be lock formed and welded directly to the frame for unitized construction. Acoustical ratings of panels with this construction minimum:
 - a. 50 STC
- C. Hinges for Panels, Closure Panels, Pass Doors, and Pocket Doors shall be:
 - 1. OP-01: Concealed laminated hinge with antifriction segments mounted between each heat-treated link. Hinge to be attached directly to panel frame. Welded internal hinge bracket shall support the hinge and allow for adjustment of hinge plates. Concealed hinges mounted into panel edge or vertical astragal are not acceptable.
- D. Panel Trim: No vertical trim required or allowed on edges of panels; minimal groove appearance at panel joints.
- E. Panel Weights:
 - 1. OP-01: 50 STC - 8 lbs./square foot

2.4 PANEL FINISH

- A. Panel finish shall be:
 - 1. OP-01: Reinforced vinyl with woven backing weighing not less than 20 ounces (567 grams) per lineal yard.
- B. Panel Trim: Exposed panel trim of one consistent color:
 - 1. OP-01: To Be Advised

2.5 SOUND SEALS

- A. Vertical Interlocking Sound Seals between panels: Roll-formed steel astragals, with reversible tongue and groove configuration in each panel edge for universal panel operation. Rigid plastic or aluminum astragals or astragals in only one panel edge are not acceptable.
- B. Horizontal Top Seals: Continuous contact extruded vinyl bulb shape with pairs of non-contacting vinyl fingers to prevent distortion without the need for mechanically operated parts.
- C. Horizontal bottom floor seals shall be:
 - 1. OP-01: Modernfold SM2 Bottom Seal. Manually activated seals providing nominal 2" (51mm) operating clearance with an operating range of + 0.50" (13mm) to -1.50" (38mm). Seal shall be operable from panel edge or face. Extended seal shall exert nominal 120 pounds (54 kg) downward force to the floor throughout operating range.

2.6 SUSPENSION SYSTEM

- A. OP-01: #17 Suspension System
 - 1. Suspension Tracks: Minimum 11-gauge, 0.12-inch (3.04mm) roll-formed steel track, suitable for either direct mounting to a wood header or supported by adjustable steel hanger brackets,

- supporting the load-bearing surface of the track, connected to structural support by pairs of 0.38-inch (10mm) diameter threaded rods. Aluminum track is not acceptable.
- a. Exposed track soffit: Steel, integral to track, and pre-painted off-white.
2. Carriers: One all-steel trolley with steel tired ball bearing wheels per panel (except hinged panels). Non-steel tires are not acceptable.

PART 3 – EXECUTION

3.1 INSTALLATION

- A. General: Comply with ASTM E557, operable partition manufacturer's written installation instructions, Drawings and approved Shop Drawings.
- B. Install operable partitions and accessories after other finishing operations, including painting have been completed.
- C. Match operable partitions by installing panels from marked packages in numbered sequence indicated on Shop Drawings.
- D. Broken, cracked, chipped, deformed or unmatched panels are not acceptable.

3.2 CLEANING AND PROTECTION

- A. Clean partition surfaces upon completing installation of operable partitions to remove dust, dirt, adhesives, and other foreign materials according to manufacturer's written instructions.
- B. Provide final protection and maintain conditions in a manner acceptable to the manufacturer and Installer that ensure operable partitions are without damage or deterioration at time of Substantial Completion.

3.3 ADJUSTING

- A. Adjust operable partitions to operate smoothly, easily, and quietly, free from binding, warp, excessive deflection, distortion, nonalignment, misplacement, disruption, or malfunction, throughout entire operational range. Lubricate hardware and other moving parts.

3.4 EXAMINATION

- A. Examine flooring, structural support, and opening, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of operable partitions. Proceed with installation only after unsatisfactory conditions have been corrected.

3.5 DEMONSTRATION

- A. Demonstrate proper operation and maintenance procedures to Owner's representative.
- B. Provide Operation and Maintenance Manual to Owner's representative.

END OF SECTION

SECTION 102800

TOILET ROOM ACCESSORIES

PART 1 - GENERAL

1.1 DESCRIPTION

- A. Work included: Provide toilet room accessories and mirrors where indicated on the Drawings, as specified herein, and as needed for a complete and proper installation.
- B. Related work:
 - 1. Documents affecting work of this Section include, but are not necessarily limited to, General Conditions, Supplementary Conditions, and Sections in Division I of these Specifications.
 - 2. Section 092600: Gypsum Wallboard Systems

1.2 QUALITY ASSURANCE

- A. Use adequate numbers of skilled workmen who are thoroughly trained and experienced in the necessary crafts and who are completely familiar with the specified requirements and the methods needed for proper performance of the work of this Section.

1.3 PRODUCT HANDLING

- A. Comply with pertinent provisions of Section 016400.

PART 2 - PRODUCTS

2.1 TOILET ROOM ACCESSORIES

- A. Provide the following products of American Specialties Inc., or equal approved in advance by the Architect. See accessory schedule in drawings for accessories, model numbers, mounting and finish.

2.2 MIRRORS

- A. Provide 1/4" polished plate glass or float glass mirror, with clear coated stainless steel frames, in the dimensions and arrangements indicated as manufactured by American Specialties, Inc. or an equal approved in advance by the Architect.
 - 1. Model: as shown on the Drawings
 - 2. Mounting Height: as shown on the Drawings

2.3 OTHER MATERIALS

- A. Provide other materials, not specifically described but required for a complete and proper installation, as selected by the Contractor subject to the approval of the Architect.

PART 3 - EXECUTION

3.1 SURFACE CONDITIONS

- A. Examine the areas and conditions under which work of this Section will be performed. Correct conditions detrimental to timely and proper completion of the Work. Do not proceed until unsatisfactory conditions are corrected.

3.2 INSTALLATION

- A. Coordinate as required with other trades to assure proper and adequate provision in the work of those trades for interface with the work of this Section.
- B. Install each item in its proper location, firmly anchored into position (with proper concealed blocking), level and plumb, and in accordance with the manufacturer's recommendations.

3.3 CLEANING

- A. At the completion of the installation of items called for under this portion of the Work, thoroughly clean each item installed with a cleaning agent approved for that use by the manufacturer of the item supplied.
- B. Remove from the area of the installation all debris created by the Work of the Section and dispose of all trash in an area approved for that use by the Architect.

END OF SECTION

SECTION 107500

FLAGPOLES

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Aluminum flagpole and flag.

1.2 REFERENCES

- A. Aluminum Association (AA): Aluminum Finishes.
- B. American Society for Testing and Materials (ASTM):
 - 1. ASTM B 241 - Standard Specification for Aluminum and Aluminum-Alloy Seamless Pipe and Seamless Extruded Tube.
 - 2. ASTM B 597 - Standard Practice for Heat Treatment of Aluminum Alloys.
- C. National Association of Architectural Metal Manufacturers (NAAMM): NAAMM FP 1001 - Guide Specifications for Design of Metal Flagpoles.

1.3 SUBMITTALS

- A. Submit under provisions of Section 01300.
- B. Manufacturer's data sheets on each product to be used, including:
 - 1. Preparation instructions and recommendations.
 - 2. Storage and handling requirements and recommendations.
 - 3. Installation instructions.
- C. Shop Drawings:
 - 1. Structural Calculations: Include structural analysis data.
 - 2. Include details of foundation system.

1.4 QUALITY ASSURANCE

- A. Installer Qualifications:
 - 1. Five years experience installing flagpoles of similar height and complexity in locale of project.
 - 2. Authorized and trained by manufacturer.

1.5 DELIVERY, STORAGE, AND HANDLING

- A. Spiral wrap flagpoles with heavy paper and enclose in a hard fiber tube or other protective container.
- B. Store products in manufacturer's unopened packaging until ready for installation.
- C. Keep flagpole and accessories covered and dry to prevent soiling or damage.
- D. Handle with protective gloves to prevent unwanted distortion.

1.6 PROJECT CONDITIONS

- A. Structural Performance: Provide flagpole assemblies, including anchorages and supports, capable of withstanding the effects of wind loads, determined according to NAAMM FP 1001 for local ground speed.

PART 2 PRODUCTS

2.1 MANUFACTURERS

- A. Acceptable Manufacturer:
 - 1. The Flagpole Warehouse; 3600 Cantrell Industrial Ct., Acworth, GA 30101. ASD. Toll Free Tel: (800) 962-0956. Fax (770)-974-4560.
 - 2. The Architect shall consider other manufacturer's of like products upon request by the Contractor prior to the bid.

2.2 FLAGPOLES

- A. Vanguard Series:
 - 1. Internal Halyard: Manually operated halyard. Ball-bearing, nonfouling, revolving truck assembly. Finish exposed metal surfaces to match flagpole.
 - a. Exposed Height: 30ft
 - b. Overall Length: 33t
 - c. Diameter: 5"base and 3" top
 - d. Wall thickness: .188"
 - e. Wind Speed: 127 mph
 - f. Mounting Device: Ground Sleeve
- B. Finish:
 - 1. Directional Sanded Satin Finish: Fine, directional, medium satin polish; buff complying with AA-M20.

PART 3 EXECUTION

3.1 EXAMINATION

- A. Do not begin installation until final grades and elevations have been established.
- B. If others determine final base elevation, confirm with Architect before proceeding.

3.2 INSTALLATION

- A. Install flagpole where shown on drawings and/or in accordance with manufacturer's written instructions.
 - 1. Flagpole shall be plumb.

END OF SECTION

DIVISION 11
EQUIPMENT

**DIVISION 12
FURNISHINGS**

NOT USED

DIVISION 13
SPECIAL CONSTRUCTION

NOT USED

DIVISION 14

NOT USED

**DIVISION 15
MECHANICAL**

REFER TO DRAWINGS

**DIVISION 16
SITE ELECTRICAL**

FOR BUILDING ELECTRICAL REFER TO DRAWINGS