EVANS
TAYLOR
FOSTER
CHILDRESS
ARCHITECTS
343 North Main Street
Memphis TN 38103

PROJECT MANUAL

September 29, 2023

For the Project Titled:
Marion Fire Station No. 1
364 East Military Road
Marion, Arkansas 72364
for Marion Fire Department

OWNER:
City of Marion
Marion, AR 72364

DESIGNER
Evans Taylor Foster Childress Architects
343 North Main Street
Memphis, Tennessee 38103
Tel: (901).525.5344 Fax (901) 525-5420
Website: www.etfc-arch.com
ETFC No. 22207

CERTIFICATE OF AUTHORIZATION
EVANS TAYLOR FOSTER CHILDRESS ARCHITECTS, PC
No. C867
ARKANSAS

REGISTERED ARCHITECT
R. LADD GAREY
NO. 4530
9-29-2023
STATE OF ARKANSAS

Architects:
Evans Taylor Foster Childress Architects
343 North Main Street
Memphis, Tennessee 38103
Phone: (901) 525-5344
Fax: (901) 525-5420

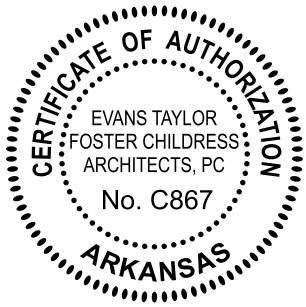
Civil Consultant:
Sorrell-Smith Eng., LLC
110 North Missouri
West Memphis, AR 72301
Phone: (870) 735-8084
Fax: (870) 735-7993

Structural, Mechanical, Electrical, and Plumbing Consultant:
Chad Stewart & Associates, Inc.
9700 Village Circle, Suite 300
Lakeland, Tennessee 38002
Phone: (901) 260-7850
Fax: (901) 260-7853

END OF SECTION

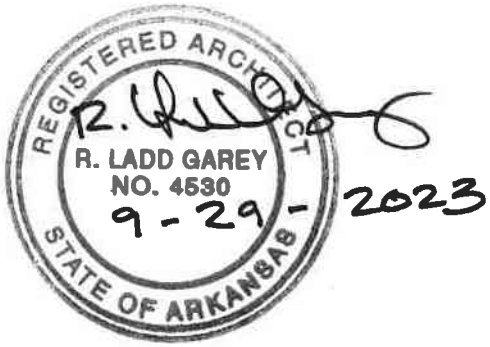
PROCUREMENT AND CONTRACTING REQUIREMENTS

1.01 DIVISION 00 -- PROCUREMENT AND CONTRACTING REQUIREMENTS



SPECIFICATIONS

2.01 DIVISION 01 -- GENERAL REQUIREMENTS



2.02 DIVISION 02 -- EXISTING CONDITIONS

2.03 DIVISION 03 – CONCRETE

Not Used

2.04 DIVISION 04 -- MASONRY

2.05 DIVISION 05 – METALS

2.06 DIVISION 06 -- WOOD, PLASTICS, AND COMPOSITES

A. 06 1000 - Rough Carpentry
B. 06 6500 - Solid Polymer Fabrications

2.07 DIVISION 07 -- THERMAL AND MOISTURE PROTECTION

A. 07 1900 - Vapor and Air Barrier
B. 07 2100 - Insulation
C. 07 2600 - Under-Slab Vapor Barrier
D. 07 4110 - Metal Wall Panels
E. 07 5423 - Thermoplastic Polyolefin (TPO) Membrane
F. 07 6500 - Flexible Flashing
G. 07 8400 - Firestopping and Smokestopping
H. 07 9200 - Joint Sealer

2.08 DIVISION 08 -- OPENINGS

A. 08 1000 - Hollow Metal Doors and Frames
B. 08 1100 - Tornado Resistant Metal Doors and Frames
C. 08 2000 - Wood Doors
D. 08 3600 - Sectional Overhead Doors
E. 08 4100 - Aluminum Storefront
F. 08 7100 - Door Hardware
G. 08 8000 - Glazing

2.09 DIVISION 09 -- FINISHES

A. 09 2500 - Gypsum Board Systems
B. 09 3110 - Porelain Floor Tile
C. 09 5100 - Acoustical Ceilings
D. 09 5460 - Linear Metal Ceilings
E. 09 6510 - LVT Flooring
F. 09 6600 - Resilient Flooring and Base
G. 09 9000 - Painting

2.10 DIVISION 10 -- SPECIALTIES

A. 10 5220 - Fire Extinguishers, Cabinets, and Accessories
B. 10 5300 - Protective Covers
C. 10 8000 - Toilet and Bath Accessories

2.11 DIVISION 11 – EQUIPMENT

A. 11 452 – Packaged Kitchen Exhaust Hood

2.12 DIVISION 12 – FURNISHINGS

A. 12 3216 – Plastic Laminate Casework
B. 12 4900 – Window Treatments

2.13 DIVISION 13 -- SPECIAL CONSTRUCTION thru 2.20 DIVISION 28 -- ELECTRONIC SAFETY AND SECURITY

Not Used

2.21 DIVISION 31 -- EARTHWORK

A. 31 3116 - Termite Protection

2.22 DIVISION 32 -- EXTERIOR IMPROVEMENTS

A. 32 1313 - Sitework Concrete
B. 32 9200 - Lawns and Grasses

2.23 DIVISION 33 – UTILITIES

Not Used

END OF SECTION

Project: City of Marion
Fire Station No, 1

Project No. 22207

Dated: September 29, 2023

Architect: ETFC Architects
343 N. Main.
Memphis, TN 38103

The City of Marion shall receive bids for the Fire Station No. 1 for Marion Fire Department, on **March 12, 2024 by 11:00 a.m.** at City Hall, Marion, AR at which time and place all bids will be publicly opened and read aloud. Bids submitted after that time will not be accepted.

Plans can be reviewed at Southern Reprographics- 222 Madison Street, Jonesboro, AR 72401 (870) 932-4349 and at Memphis Builder's Exchange, 642 Cooper St., Memphis, TN 38104 (901) 272-7495. The designated Work is to be accomplished in accordance with the Contract Documents.

Digital drawings and specs are available for electronic distribution to General Contractors. Files to be available through the ETFC West Memphis office, (870) 735 6502. Requests by General Contractors for electronic files to be emailed to rgareyarch@gmail.com

Last day for questions shall be March 5, 2024 (5:00 p.m. cut off time for last question). Questions to be emailed to rgareyarch@gmail.com

The intent of the Bid request is to obtain an offer for a stipulated Price contract in accordance with the Contract Documents.

All bidders shall be licensed contractors as required by the State of Arkansas and meet all requirements of the Contractor's Licensing Laws of Arkansas.

Bid Bond Security or Cashier's Check will be in the amount of five percent of the bid and required to accompany Contract Bid.

The successful bidder shall be required to furnish an Arkansas Performance and Payment Bond or Bonds in the amount of 100 percent of the Contract Bid.

No bid may be withdrawn for a period of forty-five (45) days subsequent to the opening of bids without the written consent of the Owner.

The Owner reserves the right to wave irregularities and to reject Bids

A **Mandatory** Pre-Bid meeting for all General Contractors will be held on February **28, 2024 at 11:00 a.m.** at the job site, 364 E Military Rd. Marion, AR, 72364.

City of Marion
By: Tracy Brick
Mayor

END OF SECTION

1. Agreement forms are legal documents. They should be prepared and approved for use on the project by the Owner and the Owner's attorney.

2. Typical agreement forms available from the American Institute of Architects, Washington, D.C., 202-626-7300, and Builders Exchange, 901-272-7495, Memphis, TN., include:

3. Wage Rates: Contractors attention is called to the fact that the wage rates for laborers and mechanics engaged in the construction of the project will be not less than required in full compliance with any state minimum wage law that may be applicable, or any published wage scales bound here in the project manual.

   AIA A701-1997, Instructions to Bidders.

END OF DOCUMENT

The following supplements modify, change and delete from or add to the “Instructions to Bidders”, AIA Document A701, 1997 Edition. Where any Article of the Instructions to Bidders is modified or deleted by these Supplementary Instructions, the unaltered provisions of that Article, Paragraph, Subparagraph or Clause shall remain in effect.

ARTICLE 2; BIDDER’S REPRESENTATIONS

2.1 BIDDERS REPRESENTATIONS

Add the following Subparagraphs:

2.1.6 The Bidder and all applicable subcontractors are licensed in accordance with the laws of the City of Marion and State of Arkansas.

2.1.7 The Bidder will complete the Work within the length of time stipulated in the Contract Documents or as stated on the Bid Form.

ARTICLE 3; BIDDING DOCUMENTS

3.1 COPIES

Delete Subparagraph 3.1.1 and substitute the following:

3.1.1 Copies of Bidding Documents may be obtained by contractors at TBD.

3.2 INTERPRETATION OF CORRECTION OF BIDDING DOCUMENTS

Add the following Clause to Subparagraph 3.2.1.

3.2.1.1 Bidders shall direct all questions to Mr. Ladd Garey, Architect, at the office of ETFC Architects, (870)735-6502 or (901)525-5344. ***All questions must be submitted no later than TBD at noon.***

3.2.1.2

3.3 SUBSTITUTIONS

Delete Subparagraph 3.3.2 and substitute the following:

Architect will consider requests for Substitutions only within 30 days after date established in Notice to Proceed.

ARTICLE 4; BIDDING PROCEDURES

4.1 FORM AND STYLE OF BIDS

Delete Subparagraph 4.1.2 and substitute the following:

4.1.2 All blanks on the bid form, appendices to bid forms, and supplements to bid form shall be filled in by typewriter or manually in ink.

ARTICLE 5; ACCEPTANCE OF BID (AWARD**)**

5.3 ACCEPTANCE OF BID (AWARD)

Delete Subparagraph 5.3.1 and substitute the following:

5.3.1 The Owner assumes no obligation to accept the lowest or any bid and reserves the right to reject any or all bids and to waive any informalities and irregularities in a Bid received and to accept the Bid which, in the Owner's judgment, is in the Owner's best interests.

ARTICLE 7; PERFORMANCE BOND AND PAYMENT BOND

7.1.1 All bids being Twenty Thousand Dollars ($20,000.00) or greater will require a Performance Bond and Payment Bond.

END OF SECTION

To: City of Marion
Marion, AR

Project: Fire Station No. 1 for Marion Fire Department

Project No. 22207

Dated: September 29, 2023

Submitted by: _____
(full name, address _____
& AR contractor's _____
License No.) _____

1. OFFER

Having carefully examined the Contract Documents, prepared by ETFC Architects, for this project as well as the premises and all conditions affecting the proposed construction, the undersigned proposes to provide all labor, materials, services, and equipment necessary for, or incidental to, the construction of the project in accordance with the Contract Documents within the time set forth, for the lump sum base of: _____

_____ Dollars
($_____)

All applicable federal taxes are included and State of Arkansas, City of Marion, Arkansas taxes, and other taxes as applicable are included in the Bid Sum.

All applicable fees are also included in the Bid Sum.

2. DEDUCTIVE ALTERNATES:

NONE

3. UNIT PRICES:

NONE

4. ACCEPTANCE:

This offer shall be open to acceptance and is irrevocable forty-five (45) days from the Bid closing date.

Bidder understands that the Owner reserves the right to reject any or all bids and to waive any informalities in the bidding.

If this Bid is accepted by the Owner within the time period stated above, we will:

Execute the Agreement within seven days of receipt of Notice of Award.

Furnish the required bonds within seven days of receipt of Notice of Award in the form described in Supplementary Conditions.

Commence work within seven days after written Notice to Proceed.

5. CONTRACT TIME

If this Bid is accepted, we will complete the Work as follows from Notice to Proceed in **three hundred sixty (360)** days:

Should the undersigned fail to fully complete the Work within the above stated time, he shall pay the City as fixed, agreed and liquidated damages and not as a penalty, the sum of Five Hundred Dollars ($500.00) for each calendar day of delay until the work is completed or accepted.

6. ADDENDA

The following Addenda have been received. The modifications to the Bid Documents noted therein have been considered and all costs thereto are included in the Bid Sum.

Addendum No. _____ Dated _____

Addendum No. _____ Dated _____

Addendum No. _____ Dated _____

Addendum No. _____ Dated _____

Addendum No. _____ Dated _____

Addendum No. _____ Dated _____

7. BID FORM SIGNATURES

Firm: _____

Signed by: _____

Title: _____

Business Address: _____

_____

_____

Indicate the Name(s) of each entity performing the listed work.

MECHANICAL (HVAC):

_____

PLUMBING:

_____

ELECTRICAL:

_____

ROOFING:

_____

END OF SECTION

1. Agreement forms are legal documents. They should be prepared and approved for use on the project by the Owner and the Owner's attorney.

2. Typical agreement forms available from the American Institute of Architects, Washington, D.C., 202-626-7300, and Builders Exchange, 901-272-7495, Memphis, TN., include:

   AIA A101-2007, Owner-Contractor Agreement Form - Stipulated Sum.

END OF DOCUMENT

1. Bonds are legal documents. They should be prepared and approved for use on the project by the Owner and the Owner's attorney.

2. Typical bond forms available from the American Institute of Architects, Washington, D.C., 202-626-7300, and Builders Exchange, 901-272-7495, Memphis, TN., include:

   AIA A312-2010, Performance Bond and Payment Bond.

3. Performance Bonds and Labor and Payment Bonds shall be in the amount of 100% of the contract amount.

END OF DOCUMENT

1. General Conditions are legal documents. They should be prepared and approved for use on the project by the Owner and the Owner's attorney.

2. Typical General Conditions available from the American Institute of Architects, Washington, D.C., 202-626-7300, and Builders Exchange, 901-272-7495, Memphis, TN., include:

   AIA A201-2007, General Conditions of the Contract for Construction.

3. Articles of the General Conditions that have been altered will be found in “Supplementary General Conditions.”

END OF DOCUMENT

The following supplements modify "AIA Document A201-2017 General Conditions of the Contract for Construction". Where a portion of the General Conditions is modified or deleted by these Supplementary Conditions, the unaltered portions of the General Conditions shall remain in effect.

Refer to Article 2.2.3 of the General Conditions. The Owner will not be obligated to furnish surveys of any nature other than those previously furnished to the Architect.

Refer to Article Warranty 3.5 Add: Except as otherwise specified, all work shall be guaranteed by the Contractor against defects arising from the use of inferior materials, equipment, or workmanship for one year from date of final completion of the Contract. If within any guarantee period, repairs or changes are required in connection with guaranteed work, which, in the opinion of the Architect is rendered necessary as the result of the use of materials, equipment, or workmanship which are inferior, defective or not in accordance with the terms of the Contract, or from omissions or work specifically required by the Plans and/or Specifications, the Contractor shall, promptly correct upon receipt of notice from the Owner, and without expense to the Owner.

All Special guarantees applicable to definite parts of the work that may be stipulated in the specifications or other papers forming a part during the first year of life of such guarantee.

Refer to Article 9.4 Add: Contractor shall submit request for Certificates of Payment by the first of each month.

Refer to Article 9.6 Add: A ten percent (10%) retainage for all pay requests and stored materials will be maintained until completion of the contract.

Refer to Article 9.10 Add: Thirty (30) days after complete acceptance of work, the Contractor will receive final payment due.

Refer to Article 10.2 Protecting Site and Building: Provide and maintain suitable protection for all openings of windows and doorways.

The Contractor shall be responsible for any unnecessary or unwarranted damage done to the building throughout the progress of the work. He will also be responsible for damage to any other features of the site.

Refer to Article 11, "Contractors Liability Insurance": of the General Conditions. The Limits of Liability referred to in this Article are hereby established as the following amounts:

General Liability – Bodily Injury – Each Occurrence	$1,000,000
- Bodily Injury – Aggregate…	1,000,000
- Property Damage – Each Occurrence	1,000,000
- Property Damage – Aggregate	1,000,000
- Personal Injury – Aggregate	2,000,000
Owners and Contractors Protective Liability	
- Each Occurrence Limit	$ 1,000,000
- Aggregate Limit	2,000,000
Automobile Insurance – Bodily Injury – Per Person – single limit	$ 1,000,000
Workmen's Compensations as required by law	

Employers' Liability – Each Accident	$ 100,000
- Disease Per Employee	100,000
- Disease (Policy Limit)	500,000
- Umbrella	$ 1,000,000

Property Insurance (Builders Risk) of the contract 100% by Contractor.

The certificates presented shall show, as additional insurers, both the Owner and the Architect.

Refer to Article 11.1.1 General Contractor shall submit, to the Owner, in triplicate, certificates showing that all required insurance is in force before starting the construction.

Refer to Article 11.2 "Owner's Liability Insurance" of the General Conditions: The General Contractor shall maintain in force during the life of the Contract, Owner's Contingent Liability Insurance which shall extend to protect the Owner's Architect from any liability that might arise from operations under this Contract.

Refer to Article 11.1.2 Performance Bond and Payment Bond: Successful Bidder will be required to furnish a Performance Bond and Labor and Materials Payment Bond to be issued by a surety company licensed to do business in the State of Arkansas, and subject to the approval of the Owner; for a sum equal to 100% of the Contract Sum. Cost of paid bonds shall be included in each bid and shall be paid for by the Contractor.

The General Contractor shall at all times during the progress of the work remove and keep the site building free of all rubbish. The General Contractor shall also make repairs to any damaged work before tendering the building for acceptance.

The General Contractor shall provide all barriers and other necessary safeguard for the protection of the public.

END OF SECTION

PART 1 - GENERAL

1.01 SUMMARY

A. Provide coordination of work.

1. Supervisory personnel.
2. Preconstruction conference.
3. Monthly meetings; distribute minutes.
4. Other meetings.

B. Submit daily and special reports.

C. Submit progress schedule, bar-chart type, updated monthly.

D. Prepare submittal schedule; coordinate with progress schedule.

E. Submit schedule of values.

F. Submit schedule of required tests including payment and responsibility.

G. Perform surveys:

1. Laying out the work and verifying locations during construction.

H. Submit and post a list of emergency telephone numbers and address for individuals to be contacted in case of emergency.

I. Submit record drawings and specifications; to be maintained and annotated by Contractor as work progresses.

J. Submit payment request procedures.

K. Perform quality control during installation.

L. Clean and protect the work.

PART 2 - PRODUCTS - Not Applicable To This Section

PART 3 - EXECUTION - Not Applicable To This Section

END OF SECTION

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

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

1.02 SUMMARY

A. The Architect-Engineer, if requested, will provide the General Contractor with one (1) electronic copy of the Contract Document Drawings for distriction to subcontractors and suppliers as a convenience in the preparation of Shop Drawings and Site Work. The cost for the electronic copy shall be as stated in Paragraph 1.2.B. The electronic copy will be provided on a compact disk in Autocad 2005 format.

B. The Architect-Engineer shall be paid a service fee of fifty dollars ($50.00) for each sheet as requested by the General Contractor in accordance with the Agreement. This fee shall be paid by the General Contractor upon acceptance of the CD.

1.03 REFERENCES

A. A copy of the Agreement is included at the end of this Section.

PART 2 – PRODUCTS (NOT APPLICABLE)

PART 3 – EXECUTION (NOT APPLICABLE)

END OF SECTION

CADD/ELECTRONIC FILE TRANSFER TO CONTRACTOR

To:

Project: City of Marion, Fire Station No. 1

At your request, we will provide electronic files for your convenience and use in the preparation of shop drawings related to the above project subject to the following terms and conditions:

We make no representation as to the compatibility of these files with your hardware or your software.

Data contained on these electronic files are part of our instruments of service and shall not be used by you or anyone else receiving these data through or from you for any purpose other than as a convenience in the preparation of shop drawings for the referenced project. Any other use or reuse by you or by others will be at your sole risk and without liability or legal exposure to us. You agree to make no claim and hereby waive, to the fullest extent permitted by law, any claim or cause of action of any nature against us, our officers, directors, employees, agents or sub consultants that may arise out of or in connection with your use of the electronic files.

Furthermore, you shall, to the fullest extent permitted by law, indemnify and hold us harmless against all damages, liabilities or costs, including reasonable attorneys' fees and defense costs arising out of or resulting from your use of these electronic files.

These electronic files are not construction documents. Differences may exist between these electronic files and corresponding hard-copy construction documents. We make no representation regarding the accuracy or completeness of the electronic files you receive. In the event that a conflict arises between the signed or sealed hard-copy construction documents prepared by us and the electronic files, the signed or sealed hard-copy construction documents shall govern. You are responsible for determining if any conflict exists. By your use of these electronic files you are not relieved of your duty to fully comply with the contract documents including, and without limitation, the need to check, confirm and coordinate all dimensions and details, take field measurements, verify field conditions and coordinate your work with that of other contractors for the project.

Because information presented on the electronic files can be modified, unintentionally or otherwise, we reserve the right to remove all indicia of ownership and/or involvement from each electronic display.

We will furnish you electronic files of the following drawing:

[Drawing List]

A service fee of $50.00 per sheet shall be remitted to us prior to delivery of the electronic files.

Under no circumstances shall delivery of the electronic files for use by you be deemed a sale by us, and we make no warranties, either express or implied, or merchantability and fitness for any particular purpose. In no event shall we be liable for any loss of profit or any consequential damages as a result of your use or reuse of these electronic files.

ETFC Architects

Accepted by: Date:

PART 1- GENERAL

1.01 Summary

A. Allowance amounts below are for materials only. Include all other costs, including installation in the base bid price.

B. Coordinate allowance with allowance for related adjacent work.

C. Notify owner of date when final decision on allowance items are required to avoid delays in the work.

D. Furnish certification that quantities of products purchased are the actual quantities needed with reasonable allowance for cutting installation losses, tolerances, mixing waste and similar margins.

E. Submit invoices or delivery slips to indicate actual quantities of materials and costs. Indicate amounts of applicable trade discounts.

PART 2- PRODUCTS

A. Brick Allowance: $600.00 per M
B. Soil Boring and Testing: $3,000.00
C. Interior Signage: $500.00
C. Exterior Signage: $18,000.00

PART 3- EXECUTION - Not Applicable To This Section

END OF SECTION

PART 1 - GENERAL

1.01 SCOPE OF WORK

A. The project consists of City of Marion- Fire Station No. 1 . The Contract Drawings more specifically locate and define the project.

1.02 SECTION INCLUDES

A. Contract Definitions

B. Contractor's and/or Subcontractor's General Duties

C. Contracts

D. Time of Substantial Completion

E. Contractor's Use of Adjacent Property

F. Owner Occupancy

G. Contractor's Use of Premises

H. Warranty

I. Owner Furnished and Installed Products

J. Owner Furnished and Contractor Installed Products

K. Sequence of Construction

1.03 RELATED REQUIREMENTS

A. Related Requirements in Other Parts of the Project Manual.
   1. Additional requirements of all parties to the Contract: General and Supplemental Conditions of the Contract.

1.04 CONTRACT DEFINITIONS

A. For the purposes of this document the following definitions of terms apply. These are treated as if singular in number and masculine in gender.
   1. OWNER: City of Marion
   2. ARCHITECT: The firm of Evans Taylor Foster Childress Architects, 343 N. Main Street, Memphis, TN 38103
   3. CONTRACTOR: The person or organization holding a direct contract with the "Owner" to execute any of the parts of work on this project and so identified in the Owner-Contractor Agreement covering that part of the Work and/or their authorized representative. Reference General Conditions Article 3.
   4. SUBCONTRACTOR: The person or organization holding a direct contract with a "Contractor" to perform work on that Contractor's portion of this work and/or their authorized

representative. A Subcontractor will have no direct contractual relationship with the Owner. Reference General Conditions Article 5.

5. VENDOR OR SUPPLIER: A person or organization furnishing standard items not manufactured to a specific shape, size or kind specifically for this project, to a "Contractor" or "Subcontractor" for their part of this work. A "Vendor" or "Supplier" will have no contractual relationship with the Owner. Reference General Conditions Article 5.

1.05 CONTRACTOR'S AND/OR SUBCONTRACTOR'S GENERAL DUTIES

A. Contractor and/or Subcontractors (as directly related to their portion of the work), except as specifically noted otherwise, shall provide and pay for:
   1. Labor, materials and equipment.
   2. Tools, construction equipment and machinery.
   3. Permanent water, heat and utilities required for this construction in addition to Temporary Utilities. (Reference Section 01 5000 and Division 22, 23 and 26.)
   4. Other facilities and services, permanent or temporary, necessary for proper execution and completion of Work.

B. Pay all legally required sales, use, social security, payroll consumer and/or other taxes.

C. Secure and pay for, as necessary, for proper execution and completion of his Work and as applicable at time of receipt of Bids:
   1. Permits
   2. Inspections
   3. Licenses

D. Give required notices.

E. Comply with codes, ordinances, rules, regulations, orders and other legal requirements of public authorities which bear on performance of Work.

F. Contractor, and/or Subcontractors through the Contractor, are to promptly submit written notice to Architect of observed variances of Contract Documents from legal requirements. The Building Codes used for this project are listed on the Drawings.

   Note: This project is to also comply with the Americans with Disabilities Act (ADA).

G. Enforce strict discipline and good order among employees. Do not employ on work:
   1. Unfit persons.
   2. Persons not skilled in assigned task.

1.06 CONTRACTS

A. Contracts for this project will be on the basis of a single "Lump Sum" General Construction Contract.

1.07 TIME OF SUBSTANTIAL COMPLETION

A. Construction of this project shall begin within ten (10) calendar days of the date of the written "Notice To Proceed" issued by the Architect upon written instructions by the Owner. Project construction must be completed within (Insert Number of Days) calendar days after beginning

date of “Notice to Proceed”, including all work designated as either general, mechanical, and/or electrical as applicable.

1.08 CONTRACTOR'S USE OF ADJACENT PROPERTY

A. No Contractor and/or Subcontractor on any operation on this project, may enter upon, use or in any way encumber the legal use of adjacent property by the Owners or legal tenants or cause unreasonable inconvenience to their use thereof without the written consent of such Owner or tenant delivered through the Owner.

1.09 OWNER OCCUPANCY

A. Occupancy By Owner Of Existing Building Spaces During Construction:
   1. The Owner will occupy Existing Building Spaces within and/or around the existing building during the completion of the Work required under this Contract for the conduct of his normal operations. The Contractor shall note that the Owner must remain operable at all times on a 24 hour basis and his operations shall not be interrupted or interfered with to the point that his operations shall cease because of construction.
   2. Contractor shall not disconnect or remove utilities serving existing portions of the building without the coordination and approval of the Owner or his authorized representative.
   3. Contractor shall at all times conduct his operations to insure the least inconvenience to the general public transacting normal business within and/or around the Existing Building Spaces.
   4. The Owner may request, thru the Architect, that renovated areas of the existing building receive concentrated work to complete them for his early occupancy. This shall be done through the Architect with consideration of sequencing and scheduling of the Work by the Contractor and his Subcontractors.
   5. Early occupancy of areas and the moving in of equipment by the Owner shall not be deemed to be acceptance of any Work performed nor shall it be deemed to be the equivalent of the filing a Notice of Completion of Any Work.
   6. The Contractor shall be held harmless by the Owner for any damage done to the Work by any early occupancy of the Owner.
   7. The appropriate Contractor and/or his Subcontractors as applicable, shall make available, in the areas occupied, any utility services, heating and cooling as are in condition to be put in operation at the time of early occupancy. All responsibility for said equipment shall remain with the Contractor and/or applicable Subcontractors while it is so operated. However, an itemized list of each piece of equipment so operated, with the date their operation commences, shall be made by the Contractor and certified by the Architect. This list shall be the basis for the commencement of guarantee period on the equipment being operated for the benefit of the Owner's early occupancy.
   8. Normal hours of work allowed:
      a. Contractor may begin his work at 7:00 A.M. and terminate all work by 7:00 P.M. for each day Monday through Sunday throughout the Contract Time.

1.10 CONTRACTOR'S USE OF PREMISES

A. The Contract Documents define the Work requirements of this Contract. Contractor and all Subcontractors shall note above that the Owner must remain operable within the existing building.

B. Access to and security of the Existing Building must be maintained during the extent of this Contract. Job conditions in coordination with Owner and Architect will determine the exact

access routes, however, this Contractor and all Subcontractors are advised that all necessary precautions must be taken to prevent interference with the Owner's operation and security requirements. Contractor shall coordinate all work in this Contract which affects the Owner's operation and security requirements with the Owner.

C. Contractors, Subcontractors and Workmen shall not trespass into existing finished and completed areas of the building without permission of the Owner.

D. Contractor and all Subcontractors shall use and maintain in clean condition, site access roads and/or routes as designated by the Owner and Architect. No other access shall be used for materials, vehicles, or men. No other parking areas may be utilized by the Contractor. Parking by or for Contractor's workmen and/or their personal vehicles will only be permitted as indicated on the drawings. Parking within other areas of the site will be permitted only during material unloading and must be removed quickly as they are unloaded.

E. Confine operations at site to areas permitted by:
1. Law
2. Ordinances
3. Permits
4. Contract Documents with Contract "Work Limits"

F. Do not unreasonably encumber site with materials or equipment.
Contractor shall limit his use of the premises for his Subcontractors, work and for storage per Section 01 5000, to allow for:
1. Work By Other Contractors and/or Subcontractors
2. Owner Occupancy
3. Public Use

G. Do not load structure with weight that will endanger structure. Verify with Architect prior to placing materials and equipment.

H. Assume full responsibility for protection and safekeeping of products stored on premises.

I. Move any stored products under Contractor's and/or Subcontractors' control which interfere with the operations of the Owner as, if and when instructed by the Owner.

1.11 WARRANTY

A. All work under this Contract shall be warranted for a minimum of one (1) year from date set out below except where longer time period is specified elsewhere in this Project Manual and/or Specifications.

B. All warranties embraced in or required by any section of the Project Manual are subject to the terms of this heading "warranty", unless otherwise expressly agreed, in writing, by the parties of the appropriate Contract. When warranted work is found faulty, the Contractor, when notified by the Owner, must within 48 hours of notification:
1. Place in satisfactory condition in every particular, any of the warranted work including that of his Subcontractors.
2. Make good all damage to the work, grounds, equipment, the building or contents thereof when unsatisfactory condition or damage develops within the period stipulated by the warranty, and is due to the use of materials or workmanship which is inferior, defective, or not in accordance with the appropriate Contract.

3. If this Contractor disturbs any work under another contract, he must restore such disturbed work to a condition satisfactory to the Architect and warrant such restored work. Upon the Contractor's failure to so proceed promptly to comply with the terms of any guarantee under this Contract or still running upon work executed by other Contractors, the Owner/Architect will have such work performed as he deems necessary to fulfill such warranties, and the Contractor shall promptly pay the Owner such sums as were expended so as to fulfill such warranty.

C. Upon a Contractor's failure to so proceed promptly to comply with the terms of any warranty under this Contract, the Owner may have such work performed as he deems necessary at the expense of the Contractor per Modifications to the General Conditions.

D. All warranties under this Contract, unless otherwise specifically agreed to in writing shall run from the date of the Certificate Of Substantial Completion as issued by the Architect for use by the Owner unless otherwise specifically identified on the Certificate aforementioned.

1.12 OWNER FURNISHED AND INSTALLED PRODUCTS (OFOI)

A. Owner Furnished and Owner Installed: (to include but not limited to the following):
1. Room numbers, name plates and interior directional signage unless denoted on the drawings.
2. Staff and Public Telephone systems
3. Televisions and Television systems
4. Loose furniture, desks, chairs, tables, carts, file cabinets and other items of a similar portable nature unless otherwise denoted on the Drawings.
5. Copy and fax machines
6. Computers, monitors, printers and wiring/cabling
7. Vending machines
8. Modular furniture systems
9. Entrance mats
10. Window blinds
11. Dedication Plaques
12. Radio and dispatching equipment and systems
13. Storage room and closet shelving systems.
14. Chalkboards/markerboards/tackboards
15. Clocks and Clock systems
16. Sound systems and wiring unless denoted on the drawings
17. Janitorial equipment other than required in Division 10.
18. Trash receptacles/dumpsters
19. Concessions Payment Systems

B. Owner's Responsibilities:
1. Purchase, handle, deliver, store, set, secure or attach in place at his own expense all items listed herein.
2. Will not interfere with the Contractor's and/or Subcontractors' work, but the Contractor and/or Subcontractors must cooperate with this work.
3. May install this equipment before or after completion of the project by the Contractor. He will not, however, install equipment requiring connection to utilities or other contract items at such time as to require the Contractor and Subcontractor to expend overtime labor.
4. Installation or storage of these items, by the Owner in any area, does not necessarily constitute acceptance of this area.

5. Make final utility and/or vent connections to his equipment, test balance, etc. as required to put equipment into operation.
6. Provide shop drawings and other related literature for all equipment which will affect the Contractor's and Subcontractors' work.

C. Contractor's Responsibilities:
1. Contractor will provide space, access, electric power, water, lights, etc. to the installers of this equipment as shown on the Contract Drawings or Specifications including work as required by his appropriate Subcontractors.
2. Review Shop Drawings, Product Data, etc. as necessary with the Owner to identify discrepancies or problems anticipated in use of the Product.
3. Cooperate with Owner and/or his installer in the installation of his equipment.
4. Contractor and/or his Subcontractors as appropriate to the work required will furnish and install all electric, water, air, vacuum, waste, exhaust, vents, etc. as shown and/or specified in Contract Documents for final connection by the Owner.

1.13 OWNER FURNISHED AND CONTRACTOR INSTALLED PRODUCTS (OFCI)

A. Products furnished and paid for by Owner and installed by this Contractor and/or his Subcontractors as applicable are not designated at this time.

B. Owner's Responsibilities:
1. Arrange for and deliver necessary Shop Drawings, Product Data and Samples to the Contractor.
2. Arrange and pay for Product delivery to the site, in accordance with the Construction Schedule.
3. Deliver Supplier's bill of materials to Contractor.
4. Inspect deliveries jointly with Contractor.
5. Submit claims for transportation damage.
6. Arrange for replacement of damaged, defective or missing items.
7. Arrange for manufacturer's warranties, bonds, service, inspections, as required.
8. The Owner’s equipment supplier shall uncrate, assemble, erect and place into proper hook-up position all material under his contract. He shall also provide shop drawings for the hook-up of utilities by the Contractor.

C. Contractor's and/or his Subcontractors' (as applicable) Responsibilities:
1. Designate delivery date for each Product in the Construction Schedule.
2. Review Shop Drawings, Product Data and Samples for any discrepancies or problems anticipated in the use of the product.
3. Receive, unload and store at the site.
4. Promptly inspect products jointly with Owner, record shortages, damaged or defective items.
5. Handle products at the site, including uncrating and storage and disposing of crating.
6. Protect products from exposure to elements and from damage.
7. Assemble, install, connect, adjust and furnish electric, water, air, vacuum, waste, exhaust, vents, etc. as shown and/or specified in the Contract Documents. The Contractor shall furnish necessary traps, disconnect switches, isolation valves, conduit junction boxes, extensions of services necessary to make the equipment operational.
8. The Contractor shall include all OFCI work in the Building Permit.
9. Repair or replace items damaged by Contractor and/or Subcontractors.

1.14 SEQUENCE OF CONSTRUCTION

A. Contractor and/or Subcontractors as applicable are to construct the work in stages to accommodate the Owner's use of the existing premises and to provide for public convenience during the construction period.

B. Coordinate the construction sequencing with the Owner's representative. Do not close off public or operational use of the existing facility until completion of one stage of construction will provide alternative usage.

C. The following general sequencing is to be utilized and followed in the construction of this work:
   1. Once the Contractor has received the Notice to Proceed from the Owner, the Contractor can then begin to mobilize on site and begin work.
   2. Erect temporary construction fencing, storage areas for materials, and locate all construction trailers and sheds where designated on the Drawings. Workmen's personal vehicles will be permitted to park within this fenced area only. Only vehicles unloading materials will be allowed within other areas of the site perimeter. These vehicles must go directly to the material staging area for unloading and will be moved immediately upon unloading. Any and all temporary fencing erected for construction security and staging will be promptly removed and relocated sequentially to maintain a safe, protected and separate work area during the full construction period.
   3. Confirm written construction sequence schedule with the Owner and Architect. Coordinate with the Owner prior to beginning the work and maintain sequence to permit the orderly rearrangement of the Owner's personnel.
   4. The above is to be used as a general guideline by the Contractor since the Owner must be aware of the construction schedule constraints. Contractor is expected to maintain adequate forces and supervision to permit simultaneous work in different areas as necessary to complete the work within the total time schedule. Within ten (10) days after Notice to Proceed, the Contractor is to establish an agreed sequence of construction complete with appropriate time frames and area identity. The Contractor is responsible for sequencing all work with the Owner.

1.15 CONSTRUCTION SITE EMERGENCY PLAN

A. An emergency plan for the construction site shall be made between the Owner, the Contractor and a member of Local Emergency Services. The plan is recommended to include but not limited to:
   1. Emergency contacts for the construction site for hours of operation and afterhours.
   2. Site plan of showing construction site and entrance for emergency vehicles to enter.

PART 2 - PRODUCTS
Not used

PART 3 - EXECUTION
Not used

END OF SECTION

PART 1 - GENERAL

1.01 SECTION INCLUDES

A. Submittal Procedures

B. Construction Progress Schedules

C. Proposed Products List

D. Shop Drawings

E. Product Data

F. Samples

G. Manufacturers' Instructions

H. Manufacturers' Certificates

I. Applicator or Installer's Certification

1.02 RELATED REQUIREMENTS IN OTHER PARTS OF THE PROJECT MANUAL

A. General and Supplemental Conditions of the Contract

1.03 CONTRACTOR RESPONSIBILITIES

A. The Contractor, or any Subcontractor, as applicable to his submittals, shall not be relieved of responsibility for any deviation from the requirements of the Contract Documents by the Architect's approval of Shop Drawings, Product Data or Samples unless the Contractor and Subcontractor have specifically informed the Architect, in writing, of such deviation at the time of submission and the Architect has given written approval to the specific deviation. The Contractor or any Subcontractor, as applicable to his submittals, shall not be relieved from responsibility for errors or omissions in the Shop Drawings, Product Data or samples by the Architect's approval thereof. The Architect's approval of a separate item shall not indicate approval of an assembly in which the item functions.

B. Provide originals or first generation copies for product data and "cut sheets".

1.05 SUBMITTAL PROCEDURES

A. Transmit each submittal with Architect accepted form.

B. Sequentially number the transmittal forms. Resubmittals to have original number with an alphabetic suffix.

C. Identify Project, Contractor, Subcontractor or Supplier; pertinent drawing sheet and detail number(s), and specification section number, as appropriate.

D. Apply Contractor's stamp, signed or initialed certifying that review, verification of products required, field dimensions, adjacent construction work, and coordination of information, is in accordance with the requirements of the Work and Contract Documents.

E. Schedule submittals to expedite the project and deliver to Architect. Coordinate submission of related items.

F. Identify variations from Contract Documents and product or system limitations which may be detrimental to successful performance of the completed Work.

G. Provide 8 inch x 3 inch blank space for Contractor and Architect review stamps.

H. Contractor/Subcontractor resubmission requirements:
1. Make any corrections or changes in the submittals required by the Architect and resubmit until approved. "Field Copy" of Shop Drawings without Architect's stamp will be removed from the Project Site.
2. Shop Drawings and Product Data:
   a. Revise initial drawings or data, and resubmit as specified for the initial submittal.
   b. Indicate any changes which have been made other than those requested by the Architect.
3. Samples: Submit new samples as required for initial submittal if rejected by initial submittal.

I. Distribution:
1. The General Contractor shall distribute (without additional cost to the Owner) reproductions of Transparencies and copies of Product Data which carry the Architect's stamp of review and/or approval to:
   a. Job site file.
   b. Record Documents file.
   c. Other affected contractors.
   d. Subcontractors as applicable.
   e. Supplier or Fabricator as applicable.
2. Distribute samples which carry the Architect's stamp of approval as directed by the Architect.

1.06 CONSTRUCTION PROGRESS SCHEDULES

A. Submit initial progress schedule in triplicate within fifteen (15) days after date established in Notice to Proceed for Owner’s and Architect's review.

B. Owner and Architect will review schedules and return review copy within ten (10) days after receipt.

C. If required, resubmit within seven (7) days after return of review copy.

D. Submit revised schedules with each Application For Payment, identifying changes since previous version.

E. Submit schedules in the form of a horizontal bar chart.

1. Provide separate horizontal bar for each trade or operation with an identifiable relationship between each Progress Schedule and Schedule of Values.
2. Horizontal time scale: Identify the first work day of each week.
3. Scale and spacing: Suitable size and scale to allow space for notations.
4. All schedules shall indicate project name.
5. All schedules shall directly relate to Time of Substantial Completion as identified in Summary of Work (Section 01 1000).

F. Content of Schedules:
   1. Construction Progress Schedule:
      a. Show the complete sequence of construction by activity with trades and dates required to meet the Substantial Completion Schedule.
      b. Show the dates for the beginning and completion of each major element of construction.
      c. Show projected percentage of completion for each item as of the first day of each week for full construction period. Identify relationship with Schedule of Values.
      d. Indicate critical or important materials and length of time after award of the Construction Contract when such materials will be required at the site.
   2. Submittals schedule for Shop Drawings, Product Data and Samples. Show:
      a. The dates for Contractor's and Subcontractor's submittals.
      b. The dates products submittals will be required for Owner-furnished products.
   3. Products Delivery Schedule. Show the delivery dates for:
      a. Products furnished by the Owner, Section 01 1000.
      b. Products specified under Allowances, Section 01 0200.

G. Progress Revisions:
   1. Indicate progress of each activity to date of submission.
   2. Show changes occurring since previous submission of schedule:
      a. Major changes in scope.
      b. Activities modified since previous submission.
      c. Revised projections of progress within completion time frame.
      d. Other identifiable changes.
   3. Provide a narrative report as needed to define:
      a. Problem areas, anticipated delays, and the impact on the schedule.
      b. Corrective action initiated to complete the total project within completion time frame should progress revisions indicate a completion delay.

H. Distribute without additional cost to the Owner, copies of the reviewed schedules to:
   1. Job site file
   2. Subcontractors as applicable

I. Instruct recipients to report promptly to Contractor, in writing, any problems anticipated by the projections shown in the schedules.

1.07 PROPOSED PRODUCTS LIST

A. Within fifteen (15) days after date of Owner-Contractor Agreement, submit complete list of major products proposed for use, with name of manufacturer, trade name, and model number of each product.

B. For products specified only by reference standards, give manufacturer, trade name, model or catalog designation, and reference standards.

1.08 SHOP DRAWINGS

A. Definitions:
   1. Shop Drawings are drawings, diagrams, schedules and other data specifically prepared for the Work by the Contractor or any Subcontractor, manufacturer, supplier or distributor or illustrate some portion of the Work.

2. Drawings shall be presented in a clear and thorough manner in appropriate size and scale with details, identified by reference to sheet and detail, schedule or room numbers shown on Contract Drawings.

B. Submit six (6) reproductions of required shop drawings. Architect/Engineer will retain two (2) reproductions and return three (3) copies to Contractor.

C. After review, distribute in accordance with article on Procedures (1.05) above and for Record Documents described in Section 01 7200 PROJECT RECORD DOCUMENTS.

1.09 PRODUCT DATA

A. Definitions:
1. Product Data are illustrations, standard schedules, performance charts, instructions, brochures, diagrams and other information furnished by the Contractor or any Subcontractor to illustrate a material, product or system for some portion of the Work.
2. Preparation:
a. Clearly mark each copy to identify pertinent products or models.
b. Show performance characteristics and capacities.
c. Show dimensions and clearances required.
d. Show wiring or piping diagrams and controls.
3. Manufacturer's standard schematic drawings and diagrams:
a. Modify drawings and diagrams to delete information which is not applicable to the Work.
b. Supplement standard information to provide information specifically applicable to the Work.

B. Submit the number of copies which the Contractor requires, plus two (2) copies which will be retained by the Architect/Engineer.

C. After review, distribute in accordance with Article on Procedures (1.05) above and provide copies for Record Documents described in Section 01 7200 PROJECT RECORD DOCUMENTS.

1.10 SAMPLES

A. Definitions:
1. Samples are physical examples which illustrate materials, equipment or workmanship and establish standards by which the work will be judged.

B. Submit samples to illustrate functional and aesthetic characteristics of the Product, with integral parts and attachment devices. Coordinate sample submittals for interfacing work.

C. Submit samples of finishes from the full range of manufacturers' standard colors in custom colors selected, textures, and patterns for Architect's selection.

D. Include identification on each sample, with full project information.

E. Submit the number or samples specified in individual specification sections; two (2) of which will be retained by Architect/Engineer.

F. Reviewed samples which may be used in the Work are indicated in individual specification sections.

1.11 MANUFACTURER'S INSTRUCTIONS

A. When specified in individual specification sections, retain at the project site one (1) copy of manufacturers' printed instructions for delivery, storage, assembly, installation, start-up, adjusting, and finishing, in quantities specified for Product Data.

B. Identify conflicts between manufacturers' instructions and Contract Documents, if any exist.

1.12 MANUFACTURER'S CERTIFICATES

A. When specified in individual specification sections, submit manufacturers' certificate to Architect for review, in quantities specified for Product Data.

B. Indicate material or product conforms to or exceeds specified requirements. Submit supporting reference date, affidavits, and certifications as appropriate.

C. Certificates may be recent or previous test results on material or product, but must be acceptable to Architect.

1.13 Applicator or Installer's Certification:

A. When specified in individual specification sections under Article entitled "Qualification" that the applicator or installer is certified approved by the manufacturer for the product specified.

1.14 Submittal Schedule:

A. All submittals, including shop drawings, product data, samples, manufacturer’s instructions, and manufacturer’s certificates must be delivered to the Architect for review within ninety (90) days after date of Owner-Contractor Agreement.

PART 2 - PRODUCTS

Not used

PART 3 - EXECUTION

Not used

END OF SECTION

PART 1 - GENERAL

1.01 SECTION INCLUDES

A. Contractor Project Coordinator

B. Contractor Coordination Schedule

C. Field Engineering and Layout

D. Alteration Project Procedures

E. Cutting and Patching

F. Project Meetings:
   1. Preconstruction Conference
   2. Progress Meetings
   3. Preinstallation Conference

1.02 RELATED REQUIREMENTS

A. Related Requirements in other parts of the Project Manual:
   1. Additional requirements of all parties to the Contract: General and Supplemental Conditions of the Contract.

1.03 CONTRACTOR PROJECT COORDINATOR

A. General Contractor is to employ the services of a qualified Coordinator at the project site for the duration of this Work with his sole duties allocated to this project only. Coordinator may be the non-working superintendent required by General Conditions and must coordinate all phases of the work. Subcontractors are required to provide a working foreman who will serve as his coordinator to the General Contractor.
   1. Qualifications: Must have prior construction experience on successful projects within the last five (5) years. A listing of projects with references will be required for review.
   2. Submit name, address and qualifications to the Architect.

B. Coordinator Duties:
   1. Coordinate his work with the Owner, all Subcontractors and all other Contractors:
      a. For temporary utilities.
      b. With the work of trades specified in Divisions 2 thru 33.
      c. Throughout this work, it will be required that the Contractor and/or Subcontractors apply their material to or over work, either existing or done by others, and which would affect his work. The coordination of all such work is the responsibility of this Coordinator. However, it is the responsibility of each Contractor, Subcontractor or Supplier to comply with this Section and 01 6000 whether or not it is specifically required, by repeating in his particular section of these specifications.
   2. Coordinate his schedule with the Owner, all Contractors and/or Subcontractors.
      a. Verify timely deliveries of products for installation by his forces or by other trades.
      b. Verify that labor and materials are adequate to maintain construction schedules.
   3. All Contractors and/or Subcontractors receiving items from other Contractors and/or Subcontractors for installation in his work, as specified or as required, shall at his expense, do the following:

a. Receive, unload, transport, store, protect and install.
b. Inspect all items, at time of receiving from carrier, for all damage, concealed or otherwise.
c. Record with the Contractor the receiving of all items and report any damage immediately after receiving. Failure to do so will make the receiving Contractor and/or Subcontractor responsible for damage, late shipment, short shipment, etc.

4. All Contractors and/or Subcontractors furnishing items to other Contractors and/or Subcontractors for installation shall:
   a. Properly schedule delivery with using Contractor and/or Subcontractor.
   b. Deliver at such time and sequence as necessary to not delay the work of the installing Contractor, other Subcontractors or the overall job schedule.
   c. Furnish at proper time to meet 4.b above, all instruction and/or drawings necessary for installation and if necessary, his personnel at the job site or installation point, for instruction or supervision.
   d. Periodically inspect the installation with his personnel at the job site or installation point for conformity to his needs. Report to Contractor any discrepancies.
   e. Deliver all items F.O.B. job site or point of installation.
5. Conduct conferences among his Subcontractors and other concerned parties as necessary to:
   a. Maintain coordination and schedules.
   b. Resolve matters in dispute.
   c. Contractor to record minutes of all meetings.
6. Participate in Project Meetings:
   a. Report his progress and his Subcontractors' progress.
   b. Recommend needed changes in schedules.
   c. Contractor to record minutes of all meetings.
7. Temporary Utilities:
   a. Coordinate installation, operation and maintenance, to verify compliance with Project requirements and with Contract Documents.
   b. Verify adequacy of service and maintenance at required locations.
8. Shop Drawings, Product Data and Samples:
   a. Prior to submittal, review for compliance with Contract Documents.
      1) Check field dimensions and clearance dimensions.
      2) Check relation to available space.
      3) Check anchor bolt settings.
      4) Review the effect of any changes on the work of other contracts or trades.
      5) Check compatibility and space requirements with equipment, materials and/or finishes and work of other trades.
      6) Check motor voltages, control characteristics, controls, interlocks, wiring and control diagrams.
9. Coordination Drawings:
   a. Prepare one (1) coordinated drawing, to assure coordination of work of, or affected by ceiling work, plumbing, sprinkler, mechanical and electrical, or to resolve conflicts.
   b. Reproduce and distribute reviewed copies of all concerned parties.
10. Verify that his Contractor and his Subcontractor maintain accurate Record Documents.
11. Substitutions and Changes:
    a. Review proposals and requests:
       1) Check for compliance with Contract Documents.
       2) Verify compatibility with work and equipment of other trades.
    b. Recommend action to Contractor, Architect and/or Owner as applicable.
12. Observe Work for compliance with requirements of Contract Documents.
    a. Maintain list of observed deficiencies and discrepancies.
    b. Promptly report deficiencies or discrepancies to Architect.

13. Assemble documentation for handling of claims or disputes involving the various work trades.
14. Equipment Startup:
    a. Check to assure that utilities and specified connections are complete and that equipment is in operable condition.
    b. Observe test, adjust and balance.
    c. Record results, including time and date of startup and promptly report same to Contractor and Architect.
15. Inspection of Materials and Equipment:
    a. Prior to inspection, check that equipment and materials are clean, repainted as required, tested and operational.
    b. Assist inspector; prepare list of items to be completed or corrected.
16. Assemble Record Documents and transmit to Architect in complete form. Do not send data that is not complete covering all items.
17. Verify and be responsible for initiating, maintaining and supervising all safety precautions and programs in connection with the Work.
18. Coordinate scheduling, submittals, and work of the various sections of specifications to assure efficient and orderly sequence of installation of interdependent construction elements, with provisions for accommodating items installed later.
19. Coordinate space requirements and installation of mechanical and electrical work which are indicated diagrammatically on drawings. Follow routing shown for pipes, ducts, and conduit, as closely as practicable; place runs parallel with line of building. Utilize spaces efficiently to maximize accessibility for other installations, for maintenance, and for repairs.
20. In finished areas, conceal pipes, ducts, and wiring within the construction. Coordinate locations of fixtures and outlets with finish elements.

1.04 CONTRACTOR'S COORDINATION SCHEDULE

A. The Coordination Schedule designates areas of basic responsibility of Contractors and Subcontractors for items of work but does not define scope.

B. Refer to the respective sections of specifications for detailed descriptions of work required.

C. Coordinator:
    1. Maintain Coordination Schedule throughout construction period.
       Record changes in responsibilities due to:
       a. Modifications to Contract.
       b. Field Orders.
       c. Delays beyond control of Contractor.
    2. Reproduce and distribute revised Schedule promptly after each change to the Contractors, Subcontractors and one (1) copy to the Architect.

1.05 FIELD ENGINEERING AND LAYOUT

A. General Contractor is to provide and pay for field engineering layout services as required for this Work.
    1. Survey or layout work required in execution of the Project.
    2. Civil, structural or other professional services required to execute construction methods.

B. Qualifications of Layout Coordinator, Surveyor or Professional:
    1. Experienced in field layout work of the type required for this project.
    2. Submit name, address and qualifications to Architect.

C. Survey and Layout Reference Points:

1. The Contract Drawings indicate the principal exterior wall line and vertical control points for this project.

D. Project Survey and Layout Requirements:
   1. Establish a minimum of two permanent bench marks on the site. Record locations, with horizontal and vertical data, on Project Record Documents.
   2. Establish lines and levels, locate and lay out, by instrumentation and/or similar appropriate means:
      a. Site improvements:
         1) Stakes for grading, fill and topsoil placement.
         2) Utility slopes and invert elevations.
      b. Batter boards for structures.
      c. Building foundation and floor levels.
   3. Establish base column lines on all floors conforming to the requirements of the Contract Documents and maintaining same control lines throughout layout to execute construction methods.

E. Records:
   1. Maintain a complete, accurate log of all control, layout and survey work as it progresses with documentation of discrepancies and solutions.

1.06 ALTERATION PROJECT PROCEDURES

A. Materials: As specified in product Sections, match existing products and work for patching and extending work.

B. Close openings in exterior surfaces to protect existing work from weather and extremes of temperature and humidity.

C. Remove, cut and patch work in a manner to minimize damage and to provide a means of restoring products and finishes to original condition.

D. Refinish visible existing surfaces to remain in renovated rooms and spaces, to specified condition for each material, with a neat transition to adjacent finishes.

E. Where new work abuts or aligns with existing, perform a smooth and even transition. Patched work to match existing adjacent work in texture and appearance.

F. When finished surfaces are cut so that a smooth transition with new work is not possible, terminate existing surface along a straight line at a natural line of division and make recommendation to Architect.

G. Where a change of plane of 1/4 inch or more occurs, submit recommendation for providing a smooth transition for Architect's review.

H. Patch or replace portions of existing surfaces which are damaged, lifted, discolored or showing other imperfections.

I. Finish surfaces as specified in individual product Sections.

1.07 CUTTING AND PATCHING

A. Description:
   1. General Contractor and/or Subcontractors, applicable to their portion of the Work, shall be responsible for all cutting, fitting and patching, including excavation and backfill, required to complete the Work or to:
      a. Make its several parts fit together properly.
      b. Uncover portions of the Work to provide for installation of ill-timed work.
      c. Remove and replace defective Work.
      d. Remove and replace Work not conforming to requirements of Contract Documents.
      e. Remove samples of installed Work as specified for testing.
      f. Provide routing penetrations of non-structural surfaces for installation of piping and electrical conduit.

B. Submittals:
   1. Submit a written request to Architect thru the General Contractor well in advance of executing any cutting or alteration which affects:
      a. The work of the Owner or any separate Contractor or Subcontractor.
      b. The structural value or integrity of any element of the Project.
      c. The integrity or effectiveness of weather-exposed or moisture resistant elements or system.
      d. The efficiency, operational life, maintenance or safety of operational elements.
      e. The visual qualities of sight-exposed elements.
   2. The request shall include:
      a. Identification of the Project.
      b. Description of the affected work.
      c. The necessity for cutting, alteration or excavation.
      d. The effect on the work of the Owner or any separate Contractor or Subcontractor, or the structural or weatherproof integrity of the Project.
      e. Description of the proposed work:
         1) The scope of cutting, patching, alteration, or excavation.
         2) The trades who will execute the work.
         3) Products proposed to be used.
         4) The extent or refinishing to be done.
      f. Alternatives to cutting and patching.
      g. Cost proposal, when applicable.
      h. Written permission of any separate Subcontractor whose work will be affected.
   3. Submit a written notice to Architect designating the date and time the work will be uncovered.

C. Materials:
   1. Comply with specifications and standards for each specific product involved.

D. Execution:
   1. Inspect existing conditions of the Project, including elements subject to damage or to movement during cutting and patching.
   2. After uncovering work, inspect the conditions affecting the installation of Products, or performance of the Work.
   3. Report unsatisfactory or questionable conditions to the Architect in writing; do not proceed with the work until the Architect has provided further instructions.

E. Preparation:
   1. Provide adequate temporary support as necessary to assure the structural value or integrity of the affected portion of the Work.

2. Provide devices and methods to protect other portions of the Project from damage.
3. Provide protection from the elements for that portion of the Project, which may be exposed by cutting and patching work, and maintain excavations free from water.

F. Performance:
1. Execute cutting and demolition by methods which will prevent damage to other work, and will provide proper surfaces to receive installation of repairs.
2. Execute excavating and backfilling by methods which will prevent settlement or damage to other work.
3. Employ the original qualified Subcontractor, Installer or Fabricator to perform cutting and patching for:
   a. Weather-exposed moisture-resistant elements.
   b. Sight-exposed finished surfaces.
4. Cut rigid materials using masonry saw or core drill. Pneumatic tools not allowed without prior approval.
5. Execute fitting and adjustment of products to provide a finished installation to comply with specified products, functions, tolerances and finishes.
6. Restore work which has been cut or removed; install new products to provide completed Work in accord with requirements of Contract Documents.
7. Fit work airtight to pipes, sleeves, ducts, conduit and other penetrations through surfaces.
8. At penetration of fire rated wall, ceiling or floor construction, completely seal voids with fire rated material, full thickness of the construction element.
9. Refinish entire surfaces as necessary to provide an even finish to match adjacent finishes:
   a. For continuous surfaces, refinish to nearest intersection.
   b. For an assembly, refinish the entire unit.

1.08 PROJECT MEETINGS

A. Description:
1. The Owner will initiate the Preconstruction Conference, coordinating with the Architect and the Contractor. The General Contractor, thru his Project Coordinator, will schedule and administer progress meetings on a biweekly basis (or as required by progress of the work) and preinstallation meeting (where required by individual specification sections). Contractor is to:
   a. Prepare agenda and preside for meetings.
   b. Distribute written notice of each meeting in advance of meeting date with a copy to Architect.
   c. Make physical arrangements for meetings.
   d. Record the minutes.
   e. Reproduce and distribute copies of minutes within a reasonable time after each meeting:
      1) To all Contractors, Subcontractors and/or participants in the meeting.
      2) To all parties affected by decisions made at the meeting.
      3) Furnish one (1) copy each of minutes to Architect, Mechanical and Electrical Engineers and Owner.
      4) Submit under provisions of Section 01 7200.
2. Coordination representatives of the Contractor, Subcontractors and Suppliers are required to attend the meetings and shall be qualified and authorized to act on behalf of the entity each represents. Refer to Article 1.04.

B. Preconstruction Conference:
1. The Owner will initiate the Preconstruction Conference, coordinating with the Architect and the Contractor. This meeting will normally be held at the site of the project immediately after or concurrent with the award of the contract.

2. Record of attendance and identification of representatives:
    a. Owner Agency and Facility Representatives
    b. Architect Principal, Project Manager, Superintendent, Subcontractors, and Suppliers
3. Confirm status of contract
4. Communication:
    a. All communication between Owner and Contractor shall be through Architect.
    b. All correspondence to bear project name and Architect's Commission Number.
5. Check need for Contract Documents, including Record Documents set, and Fire Marshal's stamped set, when appropriate.
6. Construction Schedules:
    a. Notice to Proceed
    b. Contract time
    c. Critical work sequencing, initial progress schedule
    d. Major equipment deliveries and priorities
    e. Coordination
    f. Projected substantial and final completion
7. Builder's Risk Insurance
8. Contractor's use of premises
    a. Site
    b. Facility policies and procedures
    c. Security and housekeeping
9. Construction facilities and temporary utilities
10. Architect's and Owner’s field observation reports
11. Progress meetings and other meetings
12. Progress payments, Applications for Payment
    a. Form, content, and procedure
    b. Stored materials
    c. Retainage and Consent of Surety
    d. Schedule of Values
    e. Attachments
13. Submittals:
    a. Initial construction schedule
    b. Updated progress schedules
    c. Shop drawing log
    d. Shop drawings, product data and samples
14. Change Orders and written orders for minor changes:
    a. Itemization of costs
    b. Extensions of time
15. Weekly payroll reports and wage rate regulations, if applicable
16. Testing and laboratory reports
17. Contract Close Out
    a. Substantial Completion
    b. Final Inspection
    c. Project Record Documents
    d. Final Payment

C. Progress Meetings:
1. Schedule regular biweekly Project meetings.
2. Location of meetings: The project field office of the General Contractor unless otherwise notified.
3. Attendance:
    a. Architect and/or Owner as needed.
    b. Contractor and/or his coordination representatives.
    c. Subcontractors as appropriate to the agenda.

d. Suppliers as appropriate to the agenda.
e. Others as needed appropriate to the agenda.

4. Suggested Agenda:
   a. Review and approval of minutes of previous meeting.
   b. Review of work progress.
   c. Field observations, problems, conflicts.
   d. Problems which impede Construction Schedule.
   e. Review of offsite fabrication, delivery schedules.
   f. Corrective measures and procedures to regain projected schedule.
   g. Coordination of schedules.
   h. Maintenance of quality standards.
   i. Other business as appropriate.

D. Preinstallation Conferences:
   1. When required in individual specification Section, convene a preinstallation conference at agreed location prior to commencing work of the Section.
   2. Require attendance of parties directly affecting, or affected by, work of the specific Section.
   3. Notify Architect four (4) days in advance of meeting date.
   4. Prepare agenda, preside at conference, record minutes, and distribute copies within two (2) days after conference to participants, with one (1) copy each to the Owner and to the Architect.
   5. Review conditions of installation, preparation and installation procedures, and coordination with related work.

PART 2 - PRODUCTS
Not used

PART 3 - EXECUTION
Not used

END OF SECTION

PART 1 - GENERAL

1.01 SECTION INCLUDES

A. Contractor Quality Assurance/Control of Installation

B. References

C. Schedule of References

D. Field Samples

E. Mockup

F. Manufacturers' Field Services and Reports

1.02 CONTRACTOR QUALITY ASSURANCE/CONTROL OF INSTALLATION

A. Monitor quality control over suppliers, manufacturers, products, services, site conditions, and workmanship to produce Work of specified quality.

B. Comply full with manufacturers' instructions, including each step in sequence.

C. Should manufacturers' instructions conflict with Contract Documents, request clarification from Architect before proceeding.

D. Comply with specified standards as a minimum quality for the Work except when more stringent tolerances, codes, or specified requirements indicate higher standards or more precise workmanship.

E. Perform work by persons qualified to produce workmanship of specified quality.

F. Secure products in place with positive anchorage devices designed and sized to withstand stresses, vibration, physical distortion or disfigurement.

1.03 REFERENCES

A. Reference in the specifications to known standards, such as codes, specifications, etc. promulgated by professional or technical associations, institutes and societies, are intended to mean the latest edition of each such standard adopted and published as of the date of the Invitation To Bid on this project except where otherwise specifically indicated. Referenced portion of such standards shall be considered a part of these specifications as if reproduced in full.

B. Conform to reference standard by date of issue current on date of Invitation To Bid.

C. Maintain copy of standards at job site when required by Contract Documents.

D. Should specified reference standards conflict with Contract Documents, request clarification from Architect before proceeding.

E. The contractual relationship of the parties to the contract shall not be altered from the Contract Documents by mention or inference otherwise in any reference document.

1.04 SCHEDULE OF REFERENCES

A. The following is a representative, but not necessarily the total list of such associations, institutes and societies, together with the abbreviation by which each is identified.

AAMA	Architectural Aluminum Manufacturer's Association
AASHTO	American Association of State Highway and Transportation Officials
ACI	American Concrete Institute
AIA	American Institute of Architects
AIEE	American Institute of Electrical Engineers
AISC	American Institute of Steel Construction
ANSI	American National Standards Institute
APA	American Plywood Association
API	American Petroleum Institute
ASA	American Standards Association
ASHRAE	American Society of Heating, Refrigerating and Air Conditioning Engineers
ASME	American Society of Mechanical Engineers
ASTM	American Society of Testing and Materials
AWI	Architectural Woodwork Institute
AWS	American Welding Society
AWSC	American Welding Society Code
AWWA	American Water Works Association
BIA	Brick Institute of America
CSI	Construction Specifications Institute
DHI	Door and Hardware Institute
EPA	Environmental Protection Agency
FIA	Factory Insurance Association
FS	Federal Specifications
GA	Gypsum Association
IEEE	Institute of Electrical and Electronic Engineers
IES	Illuminating Engineering Society
IGSS	Insulating Glass Certification Council
NBFU	National Board of Fire Underwriters
NEC	National Electrical Code
NEMA	National Electrical Manufacturers Association
NFPA	National Fire Protection Association
NWMA	National Woodwork Manufacturers Association
NWWDA	National Wood Window and Door Association
OSHA	Occupational Safety and Hazard Act
PCA	Portland Cement Association
SDI	Steel Door Institute
SIGMA	Sealed Insulating Glass Manufacturer's Association
SJI	Steel Joists Institute
SMACNA	Sheet Metal and Air Conditioning Contractors National Association, Inc.
SPRI	Single Ply Roofing Institute
SSPC	Steel Structures Painting Council
TCA	Tile Council of American, Inc.
UL	Underwriters' Laboratories, Inc.
USASI	United States of America Standards Institute
WWPA	Western Wood Products Association

1.05 FIELD SAMPLES

A. Install field samples at the site as required by individual specification sections for review.

B. Acceptable samples represent a quality level for the Work.

C. Where field sample is specified in individual sections to be removed, clear area after field sample has been accepted by Architect.

A. Assemble and erect specified items, with specified attachment and anchorage devices, flashings, seals, and finishes.

B. Where mock-up is specified in individual sections to be removed, clear area after mock-up has been accepted by Architect.

1.07 MANUFACTURERS' FIELD SERVICES AND REPORTS

A. Submit qualifications of observer to Architect fifteen (15) days in advance of required observations. Observer subject to approval of Architect.

B. When specified in individual specification sections, require material or product suppliers or manufacturers to provide qualified staff personnel to observe site conditions, conditions of surfaces and installation, quality of workmanship, start-up of equipment, test, adjust, and balance of equipment as applicable, and to initiate instructions when necessary.

C. Individuals to report observations and site decisions or instructions given to applicators or installers that are supplemental or contrary to manufacturers' written instructions.

D. Submit report in duplicate within ten (10) days of observation to Architect and Owner for review.

PART 2 - PRODUCTS

Not used

PART 3 - EXECUTION

Not used

END OF SECTION

PART 1 - GENERAL

1.01 WORK INCLUDES

A. Selection and Payment

B. Contractor Submittals

C. Laboratory Responsibilities

D. Laboratory Reports

E. Limits on Testing Laboratory Authority

F. Contractor Responsibilities

G. Schedule of Inspections and Tests

1.02 REFERENCES

A. ASTM D3740 - Practice for Evaluation of Agencies Engaged in Testing and/or Inspection of Soil and Rock as Used in Engineering Design and Construction.

B. ASTM E329 - Recommended Practice for Inspection and Testing Agencies for Concrete, Steel, and Bituminous Materials as Used in Construction.

1.03 SELECTION AND PAYMENT

A. Contractor shall employ and pay for the services of an approved Independent Testing Laboratory to perform specified services and testing.

B. Employment of the laboratory shall in no way relieve the General Contractor or any Subcontractor from their obligations to perform the Work of the Contract.

1.04 QUALITY ASSURANCE

A. Meet "Recommended Requirements for Independent Laboratory Qualification", published by American Council of Independent Laboratories.
B. Meet basic requirements of ASTM E329, "Standards of Recommended Practice For Inspection and Testing Agencies For Concrete, Steel and Bituminous Material As Used In Construction".
C. Authorized to operate in the State of Tennessee.

D. Laboratory Staff: Maintain a full time registered Engineer on staff to review services.

E. Testing Equipment: Calibrated at reasonable intervals with devices of an accuracy traceable to either National Bureau of Standards (NBS) Standards or accepted values of natural physical constants.

1.05 LABORATORY RESPONSIBILITIES

A. Test samples of mixes submitted by Contractor.

B. Provide qualified personnel at site. Cooperate with Architect and Contractor in performance of services.

C. Perform specified inspection, sampling, and testing of products in accordance with specified standards.

D. Ascertain compliance of materials and mixes with requirements of Contract Documents.

E. Promptly notify Architect and Contractor of observed irregularities or non-conformance of Work or Products.

F. Perform additional inspections and tests required by Architect.

G. Attend pre-construction, pre-installation conferences and progress meetings as applicable to work herein.

1.06 LABORATORY REPORTS

A. Promptly submit written report of each test and inspection; one (1) copy each to Architect, Structural Engineer (where applicable), Owner and Contractor, and one (1) copy for Project Record Documents File.

B. Include
1. Date issued.
2. Project name.
3. Testing laboratory name, address and telephone number.
4. Name and signature of Engineer registered in State and laboratory inspector or technician.
5. Date and time of sampling or inspection.
6. Record of temperature and weather conditions.
7. Date of test.
8. Location of sample or test in the Project.
9. Type of inspection, test or re-test.
10. Results of tests and compliance with Contract Documents.
11. Monetary accounting of tests by test type indicating test or re-test charges due and/or not due under this Contract.

C. Perform additional tests as required by the Architect and Owner. The Contractor shall at his expense, provide proper access, furnish necessary samples, and if required, deliver them to the testing agency when and where directed. Additional cost for the above will be paid as follows:
1. Tests for Owner's knowledge not relating to quality - paid by Owner.
2. Tests for quality of work:
   a. If tests confirms work to be as specified - paid by Owner.
   b. If test confirms work not as specified - paid by Contractor and/or Subcontractor at fault per Article 13.5 of the General Conditions.

1.07 LIMITS ON AUTHORITY OF TESTING LABORATORY

A. Laboratory may not release, revoke, alter or enlarge on requirements of Contract Documents.

B. Laboratory may not approve or accept any portion of the Work.

C. Laboratory may not perform any duties of the Contractor and/or his Subcontractors.

D. Laboratory has no authority to stop the Work.

1.08 CONTRACTOR AND/OR SUBCONTRACTORS' RESPONSIBILITIES

A. Cooperate with laboratory personnel, provide access to work.

B. Secure and deliver to the laboratory, when requested, adequate quantities of representational samples of materials proposed to be used and which require testing.

C. Provide to the laboratory thru the Architect the preliminary design mix proposed to be used for concrete, and other material mixes which require control by the testing laboratory.

D. Furnish copies of Product's test reports as required.

E. Furnish incidental labor and facilities:
   1. To provide access to Work to be tested.
   2. To obtain and handle samples at the Project Site or at the source of the product to be tested.
   3. To facilitate inspections and tests.
   4. For storage and curing of test samples.
   5. To repair test area, if sample is removed from materials requiring water-proof integrity.

F. Notify laboratory sufficiently in advance of operations to allow for laboratory assignment of personnel and scheduling of tests.
   1. When tests or inspections cannot be performed after such notice, reimburse Owner for laboratory personnel and travel expenses incurred due to Contractor's and/or Subcontractor's negligence.

G. Make arrangements with laboratory and pay of additional samples and tests required for Contractor's and/or his Subcontractor's convenience.

1.09 SCHEDULE OF INSPECTIONS AND TESTS (Reference individual sections for the required testing.)

PART 2 - PRODUCTS
Not used

PART 3 - EXECUTION
Not used

END OF SECTION

PART 1 - GENERAL

1.01 SECTION INCLUDES

A. Temporary Utilities: Electricity and Lighting, Heat and Ventilation, Water, Sanitary Facilities

B. Temporary Telecommunications Services

C. Temporary Fire Protection

D. Fencing

E. Water Control

F. Construction Aids

G. Noise and/or Vibrations During Construction

H. Exterior Enclosures

I. Interior Enclosures

J. Barriers and Barricades

K. Protection of Work

L. Field Offices and Sheds

M. Security

N. Vehicular Access and Parking

O. Progress Cleaning and Dust Control

1.02 TEMPORARY ELECTRICITY AND LIGHTING

A. Temporary electric power required for the performance of work under this Contract may be obtained from the Owner's present power source at the location and in quantities designated on the drawings and/or within Division 26 of these specifications.

B. The electrical subcontractor is to furnish and install at his expense and arrangement, all means of bringing electrical power, wiring, etc. from this Owner's point of source to the point of use or need including receptacle devices, wiring, etc. and their complete removal at completion as may be needed to provide adequate artificial lighting and power for all areas of the Work. Owner's electrical power source shall not be interrupted without specific approval and arrangement with the Owner.

C. If requirements for current/voltage exceed the Owner's capacity or type as described above, the needing Contractor and/or Subcontractor shall arrange for, pay and provide his own source at his total expense including removal of same at completion of the Work.

D. The electrical subcontractor must pay for and provide adequate protection and/or protection devices to protect the Owner's electrical source and supply including branch circuits,

panelboards, etc. as may be deemed necessary for a complete system in accord with all local and national codes.

E. The Owner will pay directly to the Power Company the cost of all electric power consumed.

1.03 TEMPORARY HEAT AND VENTILATION

A. The General Contractor is to provide temporary heat and ventilation as required to maintain adequate environmental conditions to facilitate progress of the Work, to meet specified conditions for the installation of materials and to protect materials and finishes from damage due to temperature and/or humidity.

B. Provide adequate forced ventilation of enclosed areas for curing of installed materials, to disperse humidity, and to prevent hazardous accumulations of dust, fumes, vapors or gases.

C. Portable heaters shall be standard non-smoke producing approved units such as gas (natural of LP) or approved oil burners complete with controls. NO Salamanders or open fires will be permitted.

D. Pay all cost of installation, maintenance, operation, removal and for fuel consumed.

E. When permanent building Heating, Ventilating and Air Conditioning Systems, under this Contract are installed and operable, in the opinion of the Owner and Architect, after consultation with the HVAC Subcontractor and General Contractor, he will have them placed into operation for temporary heating, ventilating and air conditioning. Placing the permanent HVAC systems into temporary use will not affect the guarantees required under this specification and will not set the beginning date of guarantees.
   1. Provisions of filters, extra filters, additional cleaning and maintenance by the HVAC Subcontractor will be as specified under Division 23 of these Specifications.
   2. Owner will pay cost of all fuel consumed.
   3. The maximum time that permanent systems can be used under a temporary basis is sixty (60) days.

1.04 TEMPORARY TELECOMMUNICATIONS SERVICES

A. Provide, maintain, and pay for telecommunications services to field office at time of project mobilization.

B. Telecommunications services shall include:
   1. Windows-based personal computer dedicated to project telecommunications, with necessary software and laser printer.
   2. Telephone Lines: One line, minimum; cellular or mobile line is acceptable.
   3. Internet Connections: Minimum of one.
   4. Email: Account/address reserved for project use.
   5. Facsimile Service: Minimum of one dedicated fax machine/printer.

1.05 TEMPORARY WATER

A. Water required for the performance of work under this Contract may be obtained from the Owner’s present supply at the location and in quantity designated on the drawings and/or within Division 22 of these specifications.

B. The plumbing subcontractor is to furnish and install all valves, piping, hose, fittings, vacuum breakers, back flow preventers and/or devices required to connect and transmit water from the Owner’s point of source to the point of his need in adequate quantity for progress of the work at

his expense. All such shall be removed at the end of the work. Owner's piping and water supply shall not be interrupted without specific approval and arrangement with the Owner.

C. If requirements for water exceed the Owner's provided service as described above, the needing Contractor and/or subcontractor shall provide his own source at his total expense including removal of same at completion of the Work.

D. The Owner will pay directly to the utility company the cost of all temporary water consumed.

1.06 TEMPORARY SANITARY FACILITIES

A. The General Contractor is to provide adequate enclosed sanitary toilet facilities for each gender in compliance with local laws, and regulations including service, cleaning, maintenance, with privacy locking.

B. The Owner's Existing Toilet Facilities may not be used by construction personnel.

1.07 TEMPORARY FIRE PROTECTION

A. The General Contractor is to provide proper and adequate portable fire extinguishing equipment at his operation when work is in progress, including requirements for Field Offices and Storage Sheds.

1.08 CONSTRUCTION FENCING

A. Chain Link Fence:
1. 8'-0" tall temporary chain link fence

1.09 WATER CONTROL

A. Grade site to drain. Maintain excavations free of water. Provide, operate, and maintain pumping equipment.

B. Protect site from puddling or running water. Provide water barriers as required to protect site from soil erosion.

C. Contractor shall erect baled hay or straw erosion check for temporary measures to control erosion or water runoff where shown on drawings or as required. Bales shall be either hay or straw containing five cubic feet or more of material. Soil laden water shall not be permitted to drain on adjacent property, drives and/or public streets without adequate erosion check and periodic cleanup.

1.10 CONSTRUCTION AIDS

A. Provide construction aids and equipment required by personnel and to facilitate the execution of the Work: Scaffolds, staging, ladders, ramps, runways, platforms, lifts, railings, hoists, cranes, chutes, appliances, equipment and other facilities. Maintain all facilities and equipment in a first-class condition for the safety and use of this construction.

B. Prolonged parking or blocking of traffic at the site will not be permitted. Provide protection necessary to maintain traffic arteries in a first class condition.

C. The Owner's present loading dock facilities, compaction equipment, and trash containers may not be used for construction purposes.

1.11 NOISE AND/OR VIBRATIONS DURING CONSTRUCTION

A. Noise and/or vibrations generated by construction of this work may at times create a problem for the Owner. The Owner recognizes and can tolerate the normal level of noise created by a majority of construction activity and, therefore, does not feel any need to set certain hours of the day when noise will be restricted. The General Contractor and all Subcontractors as applicable to their work will, however, make every effort to keep noise to a minimum.

B. However, the Owner also recognizes that during certain construction work the noise and vibration level is unusually higher than normal. These higher levels of noise and vibration may conflict with a specific activity being simultaneously conducted by the Owner. It is required of the General Contractor that agreement be secured from the Owner prior to scheduling any such activity and that the Contractor and all subcontractors cooperate if an ongoing activity becomes objectionable by its longevity or overlapping into a program started later by the Owner. It is understood and agreed that both parties will cooperate to this end so that neither will be unduly inconvenienced by this requirement.

1.12 EXTERIOR ENCLOSURES

A. Provide temporary insulated weather-tight enclosure of exterior openings to accommodate acceptable working conditions and protection for products, to allow for temporary heating and maintenance of required ambient temperatures identified in individual specification sections, and to prevent entry of unauthorized persons. Provide access doors with self-closing hardware and locks.

1.13 INTERIOR ENCLOSURES

A. Provide temporary enclosures to separate work areas from the areas of existing building occupied by Owner, to prevent penetration of dust or moisture into occupied areas, to prevent damage to existing equipment, to protect Owner’s employees and operations from construction work and to protect the public from construction work.

B. Temporary partition and ceiling enclosures: Framing and sheet materials must comply with structural and fire rating requirements of applicable codes and standards. Close joints between sheet materials and seal edges and intersections with existing surfaces to prevent penetration of dust or moisture.

1.14 BARRIERS AND BARRICADES

A. Provide, install and maintain suitable barricades, partitions and/or barriers as required to prevent and protect public entry, personnel entry, safety and to protect the Work and existing facilities.

B. Provide protection of existing trees, plants and landscaping to remain within construction limit lines or areas as shown on drawings.

C. Remove barriers and barricades when no longer needed or at completion of work.

1.15 PROTECTION OF INSTALLED WORK

A. Protect installed Work and provide special protection where specified in individual specification sections.

B. Provide temporary and removable protection for installed products. Control activity in immediate work area to minimize damage.

C. Provide protective coverings at walls, projections, jambs, sills, and soffits of openings.

D. Protect finished floors, stairs, and other surfaces from traffic, dirt, wear, damage, or movement of heavy objects, by protecting with durable sheet materials.

E. Prohibit traffic or storage upon waterproofed or roofed surfaces. If traffic or activity is necessary, obtain recommendations for protection from waterproofing or roofing material manufacturer.

F. Prohibit traffic from landscaped areas.

1.16 FIELD OFFICES AND SHEDS

A. General Contractor's Field Office and Facilities:
   1. Size: As required for general use and to provide space for project meetings.
   2. Telephone: One (1) dedicated cellular or mobile line.
   3. Furnishings:
      a. One drafting table 36 inch x 72 inch
      b. Racks and files for Project Record Documents
   4. Other furnishings: Contractor's option
   5. One 10 inch outdoor-type thermometer
   6. Portable fire extinguisher

B. Storage Material and Work Sheds:
   1. To requirements of the various trades
   2. Dimensions: Adequate for storage and handling of products
   3. Ventilation: Comply with specified and code requirements for the products stored.
   4. Heating: Adequate to maintain temperatures specified in the respective sections

C. Construction:
   1. Structurally sound, weathertight, with floors raised above ground
   2. Temperature transmission resistance: Compatible with occupancy and storage requirements
   3. At Contractor's option, portable or mobile buildings may be used.

1.17 SECURITY

A. Provide security and facilities to protect Work, existing facilities, and Owner's operations from unauthorized entry, vandalism or theft.

B. Coordinate with Owner's security program.

1.18 VEHICULAR ACCESS AND PARKING

A. Comply with regulations relating to use of streets and sidewalks, access to emergency facilities, and access for emergency vehicles.

B. Coordinate access and haul routes with governing authorities and Owner.

C. Provide and maintain access to fire hydrants, free of obstructions.

D. Provide means of removing mud from vehicle wheels before entering streets.

E. Designated existing on-site roads may be used for construction traffic.

F. Parking by or for Contractor's workers and/or their personal vehicles will be permitted within existing paved areas adjacent to project site.

1.19 PROGRESS CLEANING AND DUST CONTROL

A. Execute periodic cleaning to keep the Work, the site and adjacent properties free from accumulations of waste materials, rubbish and wind blown debris, resulting from construction operations. Water sprinkle construction site as required to prevent free blowing of dust. Keep surrounding streets on property clean and free from dirt accumulations. Remove same periodically as required.

B. Provide on-site containers for the collection of waste materials, debris and rubbish.

C. Remove waste materials, debris and rubbish from the site periodically and dispose of at legal disposal areas away from the site.

D. Remove debris and rubbish from pipes, chases, plenums, attics, crawl spaces, and other closed or remote spaces, prior to enclosing the space.

E. Clean interior spaces prior to the start of finish painting and continue cleaning on an as-needed basis until painting is finished.

F. Schedule operations so that dust and other contaminants resulting from cleaning process will not fall on wet or newly-coated surfaces.

PART 2 - PRODUCTS

2.01 MATERIALS, GENERAL

A. Materials may be new or used, but must be adequate in capacity for the required usage, must not create unsafe conditions, and must not violate requirements of applicable codes and standards.

PART 3 - EXECUTION

3.01 PREPARATION

A. Consult with Owner, review site conditions and factors which affect this section of specifications.

B. Relocate construction aids, barriers and barricades as required by progress of construction, by storage or work requirements, and to accommodate legitimate requirements of the Owner and other contractors and subcontractors employed at the site.

3.02 GENERAL

A. Comply with applicable requirements specified in sections of Division 2 thru 17.

B. Maintain and relocate barricades and barriers during construction period as appropriate.

C. Install facilities of a neat and reasonable uniform appearance, structurally adequate for the required purposes.

3.03 REMOVAL OF UTILITIES, FACILITIES AND CONTROLS

A. Remove temporary above grade or buried utilities, equipment, facilities and materials prior to Substantial Completion or no longer needed.

B. Remove underground installations to a minimum depth of two feet.

C. Clean and repair damage caused by installation or use of temporary work.

D. Restore existing facilities used during construction to original condition. Restore permanent facilities used during construction to specified condition.

END OF SECTION

PART 1 - GENERAL

1.01 SECTION INCLUDES:

A. Products

B. Existing Material

C. Transportation and Handling

D. Storage and Protection

E. Product Options

F. Acceptance of Specified Material

G. Substitutions

H. Examination of Surfaces

I. Manufacturers' Instructions

J. Hazardous Material Certification

1.02 RELATED REQUIREMENTS IN OTHER PARTS OF THE PROJECT MANUAL

A. General and Supplemental Conditions of the Contract

1.03 PRODUCTS

A. Material and equipment incorporated into the Work:
   1. Conform to applicable specifications and standards.
   2. Comply with size, make, type and quality specified, or as specifically approved in writing by the Architect.
   3. Manufactured and fabricated products:
      a. Design, fabricate and assemble in accord with the best engineering and shop practices.
      b. Manufacture like parts of duplicate units to standard sizes and gauges, to be interchangeable.
      c. Two or more items of the same kind shall be identical, by the same manufacturer.
      d. Products shall be suitable for service conditions.
      e. Equipment capacities, sizes and dimensions shown or specified shall be adhered to unless variations are specifically approved in writing.
   4. Do not use material or equipment for any purpose other than that for which it is designed or is specified.

1.04 EXISTING MATERIAL

A. Do not use material and equipment removed from existing premises except as specifically permitted by the Contract Documents.

B. Use special care in removal, handling, storage, and reinstallation to assure proper function in the completed work.

C. Arrange for transportation, storage and handling of products which require off-site storage, restorage, or renovation. Pay all costs for such work.

1.05 TRANSPORTATION AND HANDLING

A. Arrange deliveries of products in accord with the Construction Schedules, coordinate to avoid conflict with work and conditions at the site.

B. Deliver products in undamaged condition, in manufacturer's original containers or packaging, with identifying labels intact and legible.

C. Immediately on delivery, inspect shipments to assure compliance with requirements of Contract Documents and approved submittals, and that products are properly protected and undamaged.

D. All materials and equipment for which U.L. labels are required or available, provide appropriate labels on containers or packaging.

E. Provide equipment and personnel to handle products by methods to prevent soiling or damage to products or packaging.

1.06 STORAGE AND PROTECTION

A. Store and protect products in accord with manufacturer's instructions, with seals and labels intact and legible.
   1. Store products subject to damage by the elements in weather-tight enclosures.
   2. Maintain temperature and humidity within the ranges required by manufacturer's instructions.

B. Exterior Storage
   1. Store fabricated products above the ground, on blocking or skids, prevent soiling or staining. Cover products which are subject to deterioration with impervious sheet coverings, provide adequate ventilation to avoid condensation and wind blow off.
   2. Store loose granular materials in a well-drained area on solid surfaces to prevent mixing with foreign matter.

C. Arrange storage in a manner to provide easy access for inspection. Make periodic inspections of stored products to assure that products are maintained under specified conditions and free from damage or deterioration.

D. Protection After Installation. Provide substantial coverings as necessary to protect installed products from damage from traffic and subsequent construction operations. Remove when no longer needed.

1.07 PRODUCT OPTIONS

A. Products specified by reference standards or by description only: Any product meeting those standards or description.

B. Products specified by naming one or more manufacturers: Products of manufacturers named and meeting specifications, no options or substitutions allowed.

C. Products specified by naming one or more manufacturers with a provision for substitutions: Submit a request for substitution for any manufacturer not named. Reference Article 1.09.

D. Certain products are marked "No Substitution" and do not qualify under the above Para. 1.07C.

1.08 ACCEPTANCE OF SPECIFIED MATERIALS

A. Contractor and/or any Subcontractor, by entering into a contract to furnish material and/or furnish labor and material for any part of this work, agrees that the material and methods specified herein

are suitable to achieve the end results required and to permit the guarantees required, unless stated otherwise in writing to the Architect prior to execution of his Contract.

B. Though the Architect generally specifies a result rather than a method, it is considered essential to the usefulness of this specification that methods be generally outlined. No departure from results or methods specified herein will be permitted unless such permission is granted by the Architect in writing. Such permission must be obtained prior to executing each appropriate contract. If the above is not complied with, no future claims for failure because of materials, methods, etc. specified will be valid or entertained.

1.09 SUBSTITUTIONS

A. Contractors desiring to use another brand, material or manufacturer of same quality, appearance and utility to that specified may request substitution as provided below:
   1. Substitutions prior to Bidding must be made in writing and must be received by the Architect a minimum of eight (8) days prior to bid. The burden of delivery to the Architect remains totally the responsibility of the Bidder. Architect will approve or disapprove the request for substitution, in writing, and his decision shall be final and will be recorded by appropriate Addenda issued to all bidders within five (5) days prior to bid.
   2. Substitutions After Bidding will not be allowed.
   3. Unless substitutions are requested within the time periods stated above and provided above, no deviation from the specifications will be allowed. Requests for substitutions will only be considered if the Contractor submits the following:
      a. Complete technical and cost data including drawings, literature, complete specifications, test data, and samples (if requested) and such additional information as may be required by the Architect on the proposed for substitution.
      b. Similar data to above for items, if any, to be deleted by proposed substitution.
      c. Statement by Contractor that the proposed substitution is in full compliance with the Contract Documents and written statements that he:
         1) represents that he has personally investigated the proposed substitute product and determined that is equal to or superior in all respects to that specified;
         2) represents that he will provide the same warranty for the substitute that he would for that specified;
         3) certifies that the cost data presented is complete and includes all related costs and waives all claims for additional costs related to the substitution which subsequently become apparent;
         4) will coordinate the installation of the accepted substitute, making such changes as may be required for the work to be complete in all respects and
         5) will disclose the existence and extent of financial interests, whether direct or indirect, he has in subcontractors and material suppliers which he may propose for the project. Include disclosure with submittal.

1.10 EXAMINATION OF SURFACES

A. Throughout this work, it will be required that certain contractors and/or subcontractors apply their material to or over work done by others, and which would affect his work. The general coordination of all such is the responsibility of the Contractor. However, it is the responsibility of each Contractor, Subcontractor or Supplier, to which it applies, to abide by the following whether or not it is specifically required, by repeating, in his particular section of these specifications.

B. Before commencing application of his Work, he shall thoroughly examine all surfaces to receive his Work and immediately notify the Architect in writing, of any imperfections in surfaces which would, in any way, affect satisfactory completion of Work. Absence of such notification shall be construed as acceptance of surfaces to receive Work. Later claims of defects in such Work will not, in any way affect guarantee of this contractor.

1.11 MANUFACTURER'S INSTRUCTIONS

A. When Contract Documents require that installation of work shall comply with manufacturer's printed instructions, obtain and distribute copies of such instructions to parties involved in the installation.
   1. Maintain one set of complete instructions at the job site during installation and until completion.

B. Handle, install, connect, clean, condition, prepare and adjust products in strict accord with such instructions and in conformity with specified requirements. Do not proceed with work without clear instructions.

1.12 HAZARDOUS MATERIAL CERTIFICATION

A. All materials and/or systems used for completion of this project are to be free of asbestos and/or other hazardous materials per requirements of OSHA, EPA and all other regulatory agencies. All certification letters are to be attached to each product and included in Section 01700 Close Out Documents as permanent record of same.

END OF SECTION

PART 1 - GENERAL

1.01 SECTION INCLUDES

A. General Requirements

B. Substantial Completion

C. Final Review

D. Re-inspection Fees

E. Final Application for Payment

F. Contractor Close Out Submittals to Architect

G. Volume Format

H. Format - Close Out Submittal - Volume 1

I. Final Cleaning

J. Spare Parts and Maintenance Material

1.02 GENERAL REQUIREMENTS

A. Comply with requirements stated in General and Supplemental Conditions of the Contract and in Specifications for administrative procedures in closing out the Work unless modified herein.

1.03 SUBSTANTIAL COMPLETION

A. When Contractor considers the Work is substantially complete, he shall submit to Architect:
   1. A written notice that the Work is sufficiently complete that the Owner may occupy the Work for the use for which it is intended and is therefore substantially complete.
   2. A list of items to be completed or corrected and dates scheduled for completion or correction of each item.

B. Within a reasonable time after receipt of such notice, the Architect will schedule a review with the Owner to determine the status of completion. Status of completion will be judged by the entire project completion without limitation to any one phase or part of the total construction.

C. Should Architect and the Owner determine that the Work is not substantially complete, the Architect will promptly notify the Contractor in writing, stating the reasons.

D. Contractor shall remedy the deficiencies in the Work and send a second written notice of substantial completion to the Architect.

E. Architect will review the Work again under the above Para. 1.03B.

F. When Architect and Owner concur that the Work is substantially complete, Architect will:

1. Prepare a Certificate of Substantial Completion on AIA Form G704 accompanied by Contractor's list of items to be completed or corrected, as verified and amended by the Architect.
2. Submit the Certificate to Owner and Contractor for their written acceptance of the responsibilities assigned to them in the Certificate of Substantial Completion.

1.04 FINAL REVIEW

A. When Contractor determines the Work is complete, he shall submit to the Architect written certification that:
   1. Contract Documents have been reviewed.
   2. Work has been inspected by a qualified person authorized by the Contractor for compliance with Contract Documents.
   3. Work has been completed in accordance with Contract Documents.
   4. Equipment and systems have been tested and demonstrated in the presence of the Owner's representative and are operational.
   5. Testing and Balancing of the air distribution system has been completed and 4 copies of the balancing and testing records have been submitted to the Architect for evaluation and approval. (Reference Section 01 7200, Article 1.04.)
   6. Inspections or letters of acceptance for items requiring approval from a governing authority.
   7. Materials and/or systems used for completion of this project are free of asbestos and/or other hazardous materials per requirements of OSHA, EPA and all other regulatory agencies. All certification letters are to be attached thereto for the permanent record. (Reference Section 01 6000, Article 1.12.)
   8. Work is complete and ready for final inspection.

B. Within a reasonable time after receipt of the Certification above, the Architect and Owner will schedule a review to determine the status of completion. Status of Completion will be judged by the entire project completion without limitation to any one phase or part of the total construction.

C. Should Architect and/or Owner consider that the Work is incomplete or defective:
   1. Architect will promptly notify the Contractor in writing, listing the incomplete or defective work.
   2. Contractor shall take immediate steps to remedy the stated deficiencies, and send a second written certification to Architect that the Work is complete.
   3. Architect will review the Work again as Para. 1.04B above.

D. When the Architect and Owner find the Work acceptable under the Contract Documents, the Contractor will be asked to submit Close Out Submittals. Refer to Article 1.07.

1.05 RE-INSPECTION FEES

A. Should Architect perform additional reviews due to failure of the Work to comply with the claims of status of completion made by the Contractor:
   1. Owner will compensate Architect for such additional services.
   2. Owner will deduct the amount of such compensation from the final payment to the Contractor.

1.06 FINAL APPLICATION FOR PAYMENT

A. Submit the Final Application For Payment accompanied by a final statement of accounting to the Architect.

B. Statement shall reflect all adjustments to the Contract Sum.

1. The original Contract Sum
2. Additions and deductions resulting from:
   a. Previous Change Orders
   b. Deductions for non-conforming work
   c. Other adjustments as appropriate.
3. Total Contract Sum as adjusted
4. Previous payments
5. Sum remaining due

C. When the Architect and owner determine that the Close Out Submittals are complete and correct and has received the Final Application For Payment with the Statement of Account, the Architect will prepare a Final Change Order reflecting the approved adjustments to the Contract Sum which were not previously made by Change Order subject to Owner's approval.

1.07 CONTRACTOR'S CLOSE OUT SUBMITTALS TO ARCHITECT

A. The close out submittal shall be complete and submitted to the Architect as a single package in three (3) separate volumes:
   1. Volume 1: Legal Close Out Data - Project Close Out Data as required by Section 01 7000, Article 1.09.
   2. Volume 2: Project Record Documents - Per requirements of Section 01 7200.
   3. Volume 3: Project Warranties, Operation and Maintenance Data - Operating and Maintenance Data, Warranties and Bonds, Instructions to Owner's Personnel - Per requirements of Section 01 7250.

B. Refer to Article 1.08 for Volume Format.

1.08 VOLUME FORMAT

A. Each volume shall consist of commercial quality three ring binder with durable plastic covers. Use ring size appropriate to the amount of material to be included.

B. On face and edge of binder covers, print title of project and subject matter of binder when multiple binders are required.

C. Internally subdivide the binder contents with permanent page dividers with tab titles clearly printed under reinforced plastic tabs.

D. Contents: Prepare a Table of Contents for each volume with each item, product or system identified on white paper.

E. Refer to Article 1.07 for Contractor Close Out submittal of each volume.

1.09 CLOSE OUT SUBMITTAL - VOLUME 1

A. Furnish two complete sets of Legal Close Out Data.

B. Volume 1 Format shall be prepared as per Article 1.08. If two or more binders are required, identify as Volume 1A, 1B, etc.

C. Contents of this volume to include the following:
   1. Table of Contents indicating complete contents related to tab dividers.

2. Cover sheet or sheets giving complete Project Name, Contractors and Subcontractors' Name, Address, and Telephone Number, Name of Project Superintendent, Project Manager and related general information.
3. Consent of Surety to Final Payment, AIA Form G707.
4. Releases of Liens from the Contractor, all Subcontractors and major material suppliers, AIA Form G706A.
5. Contractor Affidavit of Payment of Debts and Claims, AIA Form G706.
6. Final Application For Payment, AIA Form G702 with Continuation Sheet AIA Form G703
7. Final Statement of Accounting
8. Signed Change Orders (if any)
9. Certifications - Refer to Article 1.04.
10. Other documents related to fiscal provisions
11. Contractor letters of Substantial Completion
12. Architect Prepared Certificate of Substantial Completion (AIA Form G704) with Final Architectural Punch List with each item initialed by Contractor.
13. Occupancy Permit
14. Non-Lead, Asbestos Hazardous Material Certification Letter

D. Architect will transmit one (1) copy of Volume to Owner and retain one for his records.

1.10 FINAL CLEANING

A. Execute final cleaning prior to final inspection.

B. Clean interior and exterior glass and surfaces exposed to view; remove temporary labels, stains and foreign substances, polish transparent and glossy surfaces, vacuum carpeted and soft surfaces.

C. Clean equipment and fixtures to a sanitary condition.

D. Clean or replace filters as required of operating equipment.

E. Clean debris from roofs, gutters, downspouts, and drainage systems.

F. Clean site; sweep paved areas; rake clean landscaped surfaces.

G. Remove waste and surplus materials, rubbish, and construction facilities from the site.

1.11 SPARE PARTS AND MAINTENANCE MATERIALS

A. Provide products, spare parts, maintenance and extra materials in quantities specified in individual specification sections.

B. Deliver to project site and place in location as directed prior to final payment.

PART 2 - PRODUCTS
Not used

PART 3 - EXECUTION
Not used

END OF SECTION

PART 1 - GENERAL

1.01 SECTION INCLUDES

A. Record Documents

B. Reproducible "Record As-Built Drawings"

C. Close Out Submittal

1.02 RECORD DOCUMENTS

A. General:
1. General Contractor is to maintain at the site in good condition, one complete record set of all Contract Documents for use as "Record Documents."
a. Contract Drawings
b. Project Manual and Specifications
c. Addenda
d. Supplemental Drawings
e. Change Orders and other Modifications to the Contract
f. Minutes of all project meetings
g. Architect Field Orders or written instructions
h. Construction Schedules including all revisions
i. Approved Submittals:
1) Shop Drawings
2) Product Data
3) Samples
4) Design Data
5) Test Reports
6) Manufacturer's Instructions
7) Manufacturer's Certificates
8) Applicator or Installer's Certification
9) Certifications
j. Applicator certification of substrate
k. Manufacturer's Field Reports
l. Field Test Reports (as applicable)

B. Maintenance of Documents:
1. Store Record Documents in General Contractor's field offices apart from documents used for construction. Provide secure storage space for files and racks for storage of Record Documents.
2. Maintain Record Documents in a clean, dry, legible condition and in good order. Do not use Record Documents for reference or construction use.
3. Make Record Documents available for inspection by the Architect or Owner, upon request.

C. Marking Devices:
1. Provide felt tip marking pens for recording information in the color code identified and cross-referenced to the trade required by Contract Specifications.

D. Recording:
1. Label each document "PROJECT RECORD" in neat large printed letters.
2. Record Information on a weekly basis, concurrently with construction progress. Do not "conceal" any work until required information is recorded.

a. "Concealed" under this section is defined as not exposed after completion of construction. Concealed locations include the following: In walls (hollow or solid of all types), above ceilings (all ceilings), in floors, beneath earth, floors, etc. Record exact location, routing, and identification.

3. Drawings: Legibly mark to record actual construction:
   a. Depths of various elements of foundation in relation to finish first floor datum.
   b. Horizontal and vertical locations of underground utilities, (Plumbing, Sprinkler, Mechanical and Electric) and appurtenances, referenced by dimension to permanent surface improvements.
   c. Location of internal utilities (Plumbing, Sprinkler, Mechanical and Electric) and appurtenances concealed in or above the construction, referenced to visible and accessible features of the structure including valves, tap points, junction boxes, electric wiring, test points and other related features as appropriate.
   d. Field changes of dimension and detail.
   e. Changes made by Field Order or by Change Order.
4. Specifications: Legibly mark and record at each Product section description of actual Products installed, including the following:
   a. Manufacturer's name and product model and number.
   b. Product substitutions or alternates utilized.
   c. Changes made by Addenda and Modifications.
5. Submit Record Documents as part of Close Out Submittal - Volume 2.

1.03 REPRODUCIBLE "RECORD AS-BUILT DRAWINGS":

A. "Record As-Built Drawings" will be required by the following Subcontractors:
   1. Security
   2. Mechanical
   3. Plumbing
   4. Fire Protection/Sprinkler
   5. Electrical
   6. Civil
   7. General Contractor (Structural and Architectural Modifications)

B. Prepare reproducible permanent Mylar "Record As-Built Drawings" to show construction as actually accomplished as recorded on "Project Record Documents" in Para. 1.02D above. The drawings shall be prepared by the appropriate Subcontractor by using the Record Drawings. The drawings are to be on Mylar.

C. "As-Built Drawings" will be required of the above listed Subcontractors and shall show as record:
   1. All deviations from the sizes, locations and all other features of all installations shown by the Contract Documents.
   2. Where the Contract Documents show installations in diagrammatic or schematic form the actual location will be recorded.
   3. It shall be possible, using these drawings, to correctly and easily locate, identify and establish sizes of all piping, conduit, etc. and such other features of work which will be concealed per Article 1.02 above by the following means:
      a. Locations of underground Work shall be established by dimensions to column lines or walls, and by properly referenced centerline or invert elevations and rates of fall.
      b. For work concealed in the building sufficient information shall be given so it can be located with reasonable accuracy and ease. This shall be by dimension wherever possible. Where this is not reasonably practical, illustrate the Work on the drawings in relation to the spaces in the building near which it was actually installed.
      c. Such other notes as required to designate size, service, etc.
   4. Additional drawings shall be provided by the Subcontractor, as necessary for clarification.

5. All such drawings shall be done carefully and neatly by a competent draftsman and in a form approved by the Architect.
6. Submit "As-Built" Drawings as part of Close Out Submittal - Volume 2.

1.04 CLOSE OUT SUBMITTAL - VOLUME 2

A. Furnish one (1) complete set of Project Record Documents with additional required sets of Record “As-Built” Drawings.

B. Volume 2 of Close Out Submittal shall be submitted along with Volume 1 and 3 as defined in Section 01700, Article 1.07.

C. Volume 2 Format shall be prepared as per Section 01700, Article 1.08. If two or more binders are required, identify as Volume 2A, 2B, etc.

D. Contents of this volume to be in the following format:
1. Table of Contents indicating complete contents related to tab dividers and items separated from binders.
2. Cover sheet or sheets giving complete Project Name, Contractor and Subcontractor's Name, Address, Telephone Numbers, Name of Project, Superintendent, Project Manager and related general information.
3. Project Record Documents not required to be in binders. List in Table of Contents.
4. One (1) set of marked-up blueline “Record Drawings” from the project site.
5. One (1) set of Project Record Mylar reproducible “As-Built” drawings.
6. Four (4) sets of Project Record bond copies of “As-Built” drawings.
7. Four (4) sets of Project Manual marked to show in each Specification Section the actual manufacturer, trade names, catalog number, and supplier of each product.
8. Supplemental Drawings not required to be in binder. List in Table of Contents.
9. Shop Drawing Submittals:
   a. Submit one copy of each document bearing Architect's "Review for General Compliance" stamp denoted "No Exception Taken" or "Make Correction Noted."
   b. Include documents in binders where possible. List in Table of Contents those items not included in binder.
10. Minutes of all project meetings..
11. Paint color schedules.
12. Testing Laboratory "Product Test Reports".
13. Testing and Balancing Record of Air Distribution System.
14. Keying Schedule and Lock Pinning Code.
15. 100 blank keys with name, address and phone number of local supplier.

PART 2 - PRODUCTS
Not used

PART 3 - EXECUTION
Not used

END OF SECTION

PART 1 - GENERAL

1.01 SECTION INCLUDES

A. General Requirements

B. Warranties and Bonds

C. Materials and Finishes

D. Equipment and Systems

E. Close Out Submittals

F. Instruction of Owner Personnel

1.02 GENERAL REQUIREMENTS

A. The General Contractor, his Subcontractors and Material Suppliers, as applicable to their portion of the work, shall compile and maintain accurate Project Record Documents, Submittals (Shop Drawings, Product Data, Manufacturer's Service), Maintenance and Operation Data, Internal Wiring Diagrams and related information that the Owner may need for his use in maintenance, operation, repair, renovation or future additions to the Project and/or its equipment. Manufacturers, Suppliers, Subcontractors, Representatives, bidding the work under this Contract are advised that proprietary information on their equipment is and will be required for submittal herein. Final payment will not be made until all data is submitted in quantity and form required herein.

B. Furnish all warranties, applicator/manufacturer certifications, letters of acceptance, maintenance agreements, bonds, operation data, maintenance service data, parts list, wiring diagrams and other documents as required by this Section of Specifications.

1.03 WARRANTIES AND BONDS

A. Assemble warranties and bonds, service and maintenance contracts, executed by each of the respective manufacturers, suppliers and subcontractors, neatly typed, in orderly sequence. Provide complete information for each item.
   1. Product or work item
   2. Firm, with name of principal, address and telephone number
   3. Scope
   4. Date of beginning of warranty, bond, or service and maintenance contract
   5. Duration of warranty, bond, or service and maintenance contract
   6. Provide information for Owner's personnel:
      a. Proper procedure in case of failure
      b. Instances which might affect the validity of warranty or bond
   7. Contractor, name of responsible principal, address and telephone number

1.04 MATERIALS AND FINISHES

A. Content, for architectural products, applied materials and finishes:
   1. Manufacturer's data, giving full information on products
      a. Catalog number, size, composition
      b. Color and texture designations

c. Information required for reordering special manufactured products
2. Instructions for care and maintenance
   a. Manufacturer's recommendation for types of cleaning agents and methods
   b. Cautions against cleaning agents and methods which are detrimental to the product
   c. Recommended schedule for cleaning and maintenance

B. Content, for moisture protection and weather-exposed products:
1. Manufacturer's data, giving full information on products
   a. Applicable standards
   b. Chemical composition
   c. Details of installation
2. Instructions for inspection, maintenance and repair

C. Additional requirements for maintenance data: The respective sections of Specifications

1.05 EQUIPMENT AND SYSTEMS

A. Each Item of Equipment and Each System: Include description of unit or system and component parts including all proprietary information. Identify function, normal operating characteristics, and limiting conditions. Include performance curves, with engineering data, wiring diagrams, and tests, and complete nomenclature and commercial number of replaceable parts.

B. Panelboard Circuit Directories: Provide electrical service characteristics, controls and communications.

C. Include color coded wiring diagrams as installed.

D. Operating Procedures: Include start-up, break-in, and routine normal operating instructions and sequences. Include regulation, control, stopping, shut-down and emergency instructions. Include summer, winter and any special operating instructions.

E. Maintenance Requirements: Include routine procedures and guide for trouble-shooting; disassembly, repair, and re-assembly instructions; and alignment, adjusting, balancing and checking instructions.

F. Provide servicing and lubrication schedule, and list of lubricants required.

G. Include manufacturer's printed operation and maintenance instructions.

H. Include sequence of operation by controls manufacturer.

I. Provide original manufacturer's parts list, illustrations, assembly drawings, and diagrams required for maintenance. Proprietary information to be included.
1. Predicted life of parts subject to wear.
2. Items recommended to be stocked as spare parts.

J. Provide control diagrams by controls manufacturer as installed.

K. Provide Contractor's coordination drawings, with color coded piping diagrams as installed.

L. Provide charts of valve tag numbers, with location and function of each valve, keyed to flow and control diagrams.

M. Provide list of original manufacturer's spare parts, current prices, and recommended quantities to be maintained in storage.

N. Additional Requirements: As specified in individual product specification sections.

O. Additional requirements for operating and maintenance data: Reference respective sections of Specifications.

1.06 CLOSE OUT SUBMITTAL - VOLUME 3

A. Furnish four (4) complete sets of Project Warranty, Operation and Maintenance Data.

B. Volume 3 of Close Out Submittal shall be submitted along with Volume 1 and 2 as defined in Section 01700, Article 1.07.

C. Volume 3 Format shall be prepared as per Section 01700, Article 1.08. If two or more binders are required, identify as Volume 3A, 3B, etc.

D. Contents of this volume to be in the following format:
1. Table of Contents indicating complete contents. Relate to tab dividers.
2. Cover sheet or sheets giving complete Project Name, Contractor's and Subcontractors' Name, Address, Phone Number, Name of Project Superintendent, Project Manager and related general information
3. Division 0: List Architect and Engineers complete with Name, Address, Telephone Number
4. Division 1A: General Warranties, Agreements and Bonds
   a. Contractor's Certification as described in Items 1 thru 6 under Final Inspection in Section 01700 Contract Close Out, Para. 1.04A
   b. Contractor's Warranty of Work
5. Division 1B: Certificates and Acceptance
   a. Certificate of Substantial Completion
6. Division 1C: Subcontractors and Materials Suppliers
   a. Provide a complete listing of subcontractors and materials suppliers including company name, address, phone number, contact person and local representative.
   b. Include complete product description with each subcontractor or material supplier.
7. Division 1D: Maintenance Materials
   a. List materials and parts furnished for the Owner's use under this contract.
8. Division 2 thru 17: Technical Data
   a. Provide warranties, agreements, maintenance service and operation manuals, and related data as required by each Section of Specifications. Furnish preprinted copies of each manufacturer's maintenance service and use instructions as required by the Specifications.
   b. Reference any oversize documents that cannot be neatly folded and bound in this binder and furnish separately with proper identification.
   c. When manufacturer's cut sheets are used for product identification, plainly mark the specific items included in this Project.

1.07 INSTRUCTION OF OWNER'S PERSONNEL

A. Prior to final inspection or acceptance, fully instruct Owner's designated operating and maintenance personnel in the operation, adjustment and maintenance of all products, equipment and systems.

B. Do not start-up or operate equipment without written consent of the Owner or his authorized agent.

C. For equipment requiring seasonal operation, perform instructions for other seasons within six months.

D. Use operation and maintenance manuals as basis for instruction. Review contents of manual with personnel in detail to explain all aspects of operation and maintenance.

E. Prepare and insert additional data in Operation and Maintenance Manual when need for such data becomes apparent during instruction.

PART 2 - PRODUCTS
Not used

PART 3 - EXECUTION
Not used

END OF SECTION

PART 1-GENERAL

1.1 DESCRIPTION

A. All new slopes and disturbed areas shall be treated for erosion control in accordance with these specifications including topsoil, seeding, silt fencing, fertilizing and watering.

1.2 TOPSOIL

A. This item shall consist of the furnishing as necessary and placement of topsoil on new slopes and on areas disturbed by the project work, in accordance with SECTION 628 – TOPSOIL, FURNISHED AND PLACED and SECTION 620 – SEEDING as per the AHTD Standard Specifications.

B. Topsoil shall be the surface layer of soil with no admixture of refuse or material toxic or inhibitive to plant growth and shall be reasonably free of subsoil, brush, roots, rocks, clay lumps, or similar objects larger than 2".

The topsoil furnished shall have a pH range of 5.5 to 7.6 when tested in accordance with the "Methods of Testing" of the Association of Official Agricultural Chemists. The organic content shall be not less than 3% nor more than 20% as determined by the Wet Combustion Method (chronic acid reduction). There shall be not less than 20% nor more than 80% of the material passing the 200-mesh sieve as determined by the Wash Test in accordance with AASHTO.

C. Contractor is responsible for all monitoring of Erosion Control Measures as authorized under NPDES General Permit ARROOOO.

D. Immediately prior to dumping and spreading topsoil, the surface shall be loosened by disc to a minimum depth of two (2) inches. Prior to placing topsoil, the area shall be cleared of rocks in excess of two (2) inches and any other debris or trash.

E. Topsoil shall be spread evenly on the prepared areas to a uniform depth of four inches after compaction, unless otherwise called for on the Plans.

Spreading shall not be performed when ground conditions are too wet or otherwise in a condition detrimental to the work.

After spreading, clods shall be broken up. Rocks in excess of two inches and any debris shall be removed.

After spreading and debris removal is complete, the topsoil shall be compacted by rolling with cultipacker

2.1 SEEDING FERTILIZER AND WATERING

A. Seed used shall be Bermuda Grass, common, unhulled, broadcast at a rate of 20 pounds per acre where called for in the Plans, if the work progresses such that seeding can be accomplished March 1 thru September I.

If seeding is accomplished in times other than March through September, the seed shall be wheat applied at the rate of 30 pounds per acre.

B. Seed shall be delivered to the site in tagged bags. Tag information shall include vendor, seed type, percentage of weed content, and percentages of any other impurities.

C. Fertilizer shall be 10-20-10 and shall be spread at the rate of 400 pounds per acre.

D. The Contractor shall water, reseed, and re-water the seeded areas as necessary to develop a vigorously growing stand of grass. Once a satisfactory stand has been established, the Owner shall be responsible for necessary maintenance.

E. Mulch material with asphalt tack shall be spread as required to hold grass during establishment of turf as directed by the Engineer.

2.2 EROSION BARRIERS

A. Hay bales shall be required on any disturbed areas that are subject to erosion as directed by the Engineer. A minimum set of five hay bales shall be placed across the flat bottom ditch upon completion of ditch shaping. These bales will be placed on 200-foot centers and maintained until grass is established.

B. Hay bales shall be replaced in accordance with the Plans and in accordance with the Standard Specifications of the AHTD, Section 621 – TEMPORARY EROSION CONTROL ITEMS AND DEVICES.

END OF SECTION

PART 1-GENERAL

1.1 SECTION REQUIREMENTS

A. Traffic: Minimize interference with adjoining roads, streets, walks, and other adjacent occupied or used facilities during site-clearing operations.

B. Salvable Improvements: carefully remove items indicated to be salvaged and store on Owner's premises where indicated.

C. Notify utility locator service for area where Project is located before site clearing.

D. Any discharge permits are the responsibility of the contractor.

PART 2-PRODUCTS (Not Applicable)

PART 3-EXECUTION

3.1 PREPARATION

A. Protect and maintain benchmarks and survey control points from disturbance.

B. Install erosion and sedimentation control measures before site clearing.

C. Protect site improvements to remain from damage. Restore damaged improvements to condition existing before start of site clearing.

D. Locate and clearly flag trees and vegetation to remain or to be relocated.

E. Protect remaining trees and shrubs from damage and maintain vegetation. Employ a licensed arborist to repair tree and shrub damage. Restore damaged vegetation. Replace damaged trees that cannot be restored to full growth, as determined by arborist.

F. Do not store materials or equipment or permit excavation within drip line of remaining trees.

G. Locate, identify, disconnect, and seal or cap off utilities indicated to be removed.

3.2 SITE CLEARING

A. Strip topsoil. Stockpile topsoil that will be reused in the Work.

B. Remove obstructions, trees, shrubs, grass, and other vegetation to permit installation of new construction. Removal includes digging out stumps and obstructions and grubbing roots.

C. Remove existing above and below-grade improvements as indicated and as necessary to facilitate new construction.

D. Remove slabs, paving, curbs, gutters, and aggregate base as indicated.

E. In areas not to be further excavated, fill depressions resulting from site clearing. Place and compact satisfactory soil materials in 6-inch thick layers to density of surrounding original ground.

F. Dispose of waste materials, including trash, debris, and excess topsoil, *off* Owner's property. Burning waste materials on-site is not permitted.

END OF SECTION

PART 1- GENERAL

1.1 Work Included:

A. Finish grade sub-soil

B. Cutout areas to receive stabilizing base course materials for paving and sidewalks.

C. Place, finish grade and compact top soil.

1.2 PROTECTION

A. Prevent damage to existing fencing, trees, landscaping, natural features benchmarks, pavement and utility lines.

PART 2 - MATERIALS

2.1 Topsoil: friable loam free from sub-soil, roots, grass, excessive amount of weeds, stones and foreign matter; acidity range (pH) of 5.5 to 7.5; containing a minimum of 25% organic matter. Use top soil stockpiled on site if conforming to these requirements.

PART 3- EXECUTION

3.1 SUB-SOIL PREPARATION

A. Rough sub-soil systematically to allow for a maximum amount of natural settlement and compaction. Eliminate uneven areas and low spots. Remove debris, roots, branches and stones.

B. Cut out areas, to sub-grade elevation, which are to receive stabilizing base for paving and sidewalks.

C. Bring sub-soil to required levels, profiles and contours. Make changes in grade gradual. Blend slopes into level areas.

D. Slope grade away from building minimum 12 inches in 10 feet unless otherwise indicated on drawings.

3.2 PLACING TOPSOIL

A. Place topsoil in areas where seeding, sodding, and planting is to be performed.

B. Use topsoil in relatively dry state. Place during dry weather.

C. Fine grade topsoil eliminating rough and low areas to ensure positive drainage. Maintain levels, profiles and contours of sub-grades.

3.3 SURPLUS MATERIAL

A. Remove surplus sub-soil and topsoil from site.

8. Leave stockpile areas and entire job site clean and raked, ready to receive landscaping.

END OF SECTION

PART 1- GENERAL

1.1 SECTION REQUIREMENTS

A. The Contractor shall include in the bid and will be responsible for all costs associated with the following:
   1. Field Layout of construction activities including all lines & grades.
   2. All on-site material testing per specifications and performed by a certified testing laboratory.

B. Description: This section covers clearing, grubbing, stripping of surface vegetation, embankment and excavation as shown in the plans and as outlined in these specifications. All work performed under this section shall comply with the Standard Specifications for Highway Construction, 2003 Edition, of the Arkansas State Highway and Transportation Department, Section 210, Excavation and Embankment unless otherwise specified.

C. Construction Layout: The contractor shall provide all necessary surveying to complete this project. The cost for this work shall be included in contractor's bid as incidental work for pay items provided in his bid proposal. The engineer will provide initial horizontal and vertical control for the contractor to complete his work.

D. Clearing and Grubbing: Work under this item shall include the removal of all trees, roots, sod and other debris within the limits of the construction work area to a minimum depth of 12 inches below the existing ground. All debris shall be disposed of by the contractor. Topsoil may be stockpiled for future use.

E. Excavation: All excavation shall be classified as "Unclassified Excavation" regardless of the material encountered. It shall include the removal and disposal of all material within the limits of the typical section as shown by the plans. The excavated material may be used as fill material only in areas outside pavement and structures.

F. Compaction: The compaction of the subgrade shall be in accordance with applicable parts of SECTION 210 of the ArDOT Standard Specifications.

G. Temporary Roads: See Drawings for locations of temporary road locations. Contractor to provide sand and stone temporary roads to site. He shall remove and regrade roads at the completion of the project.

PART 2- PRODUCTS

2.1 MATERIALS

A. Fill Material: All fill material shall consist of good quality granular fill, such as sands having less than 10 percent fines passing the No. 200 sieve. It shall be free of any organic material and have a liquid limit less than thirty-five (35) and a plasticity index of

less than twenty (20) and greater than 10. All sources of embankment material shall be approved by the engineer before placement. Haul routes to the site shall be maintained and kept clean by the contractor.

B. Subqrade: All fill material shall be placed in maximum lifts of 8" of loose material and should be compacted near optimum moisture content value. The tolerance of the completed subgrade shall be within ½ inch, plus or minus, of the grade indicated on the plans.

PART 3-GEOTEXTILE FABRIC

GEOTEXTILE FABRIC- Refer to Section 625 Arkansas State Highway Commission Standard Specifications.

PART 4 -EXECUTION

A. Oualitv Control and Acceptance Testing: The CM/GC shall obtain the services of a certified testing laboratory to conduct in-place testing of all subgrade.

B. The minimum frequency of acceptance testing shall be one test for density and moisture content per every 3,000 S.Y. of area covered. Testing shall be conducted at these intervals across every 8" lift.

C. Clean-Up: The contractor shall keep the site clean of any debris resulting from the construction of this project.

D. Removal and Disposal: The contractor shall remove and dispose of any concrete, asphalt, dirt and etc. from the site as shown on plans. All material shall be disposed of at an approved landfill at contractor's expense.

END OF SECTION

PART 1 GENERAL

1.01 SCOPE OF WORK

A. Furnishing of and paying for all labor, services, appliances, materials and equipment necessary for execution, installation and completion of all work specified herein and as shown on drawings.

B. Section Includes:
   1. Interior and exterior demolition work required to protect, install, brace, support and adjoin the existing work with new work required by this contract.
   2. Cutting and bracing required to provide new openings within existing work for new work required by this contract.
   3. Erection, maintenance and removal of dust proof, sound resistant and protection partitions as required for the duration of this work under coordination with the Owner.
   4. Removal and salvage of such debris and materials generated by the Work including complete disposal away from the project site.
   5. Delivery of salvage materials to the location designated by the Owner for those materials defined herein to be salvaged to the benefit of the Owner.

1.02 PROJECT RECORD DOCUMENTS

A. Submit under provisions of Section 01 7200.

B. Accurately record actual location of capped utilities.

1.03 REGULATORY REQUIREMENTS

A. Obtain required permits from authorities.

B. Notify affected utility companies before starting work and comply with their requirements.

C. Do not close or obstruct egress width to exit.

D. Do not disable or disrupt building fire or life safety system without prior written notice to the Owner.

E. Conform to procedures applicable when discovering hazardous or contaminated materials.

1.04 SEQUENCING

A. Sequence work under the provisions of Section 01 1000.

1.05 SCHEDULING

A. Schedule work under the provisions of Section 01 3000.

B. Schedule work to coincide with new construction.

C. Describe demolition removal procedures and schedule.

PART 2 PRODUCTS

Not Used

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify that areas of the building to be demolished are unoccupied and discontinued in use by the Owner. Verify schedule of demolition with construction sequencing schedule.

B. Do not commence work until conditions are acceptable to Owner.

3.02 PREPARATION

A. Erect and maintain temporary partitions to prevent spread of dust, odors and noise to permit continued Owner occupancy, as specified in Section 01 5000.

B. Protect existing materials which are not to be demolished.

C. Arrange for, and verify termination of utility services, if any, to include removing and/or capping lines, etc., as applicable. Do not disconnect services to occupied areas; coordinate this work with the Owner.

3.03 PROTECTION

A. Execute all demolition work in an orderly and careful manner with due consideration for existing structure and the Owner's operation including any parts of the surrounding areas which are to remain. Barricade and cover as necessary to protect pedestrians, workmen and adjacent properties. Protect any existing active service lines, indicated or not. Repair and make good any damage to adjoining surfaces caused by these operations.

3.04 DISPOSITION OF REMOVED MATERIAL

A. All material removed under this contract, which is not to be salvaged or reused, shall become the property of the Contractor and be promptly removed from the site. At all times use movable debris boxes; convey the material through the building. Do not store or permit debris to accumulate on the site.

B. Do not burn or bury material on site. Periodically broom clean to allay dust.

3.05 DEMOLITION WORK

A. Floors:
   1. Remove, cut and/or brace concrete floors where or as required to permit installation of new work. Exercise care to avoid damage to the Owner's waterproofing systems and underground subsurface drainage systems.
   2. Remove resilient flooring, carpet and/or other finished floor materials as shown on Contract Documents, or as required, including adhesive to the extent that subsurfaces will present a smooth, even plane, ready for application of new materials.
   3. Holes, as required in existing floor slabs for new pipe, ducts and conduit as shown on drawings or as required, shall be removed and repaired.

4. Removal of and/or patching of floor slabs above grade must be consistent with maintaining fire integrity of the Owner's structure and to match existing or as required by governing officials.

B. Walls:
1. Remove interior and/or exterior walls and/or partitions including concrete block, precast concrete, brick, gypsum, plaster, partitions, etc. as shown on the drawings or as required to install and align with new work required under this Contract. Maintain fire resistance integrity of all walls having such fire integrity.
2. Walls or sections of walls shall not be permitted to fall on floors of the building in masses to exceed safe carrying capacity of floors. Existing floors shall be properly protected with 1/2 inch plywood both sides of a partition to be demolished. Do all demolition work required to complete this work.

C. Ceilings:
1. Remove all ceilings as shown on drawings and as necessary to complete all work shown on the drawings and/or required.

D. Roofing and/or Waterproofing:
1. Remove only as required for new construction and maintain Owner's waterproofing integrity by temporary and/or permanent methods as dictated by construction sequencing. Reinstall flashing, roofing, and/or waterproofing as applicable in a manner to assure water-tightness.

E. New Openings in Existing Walls, Floors or Roof:
1. Cut new openings where required, of correct size to permit installation of frames, anchors, curbs, etc. as required for new work. Coordinate with others for installation of new work.

3.06 SALVAGE MATERIALS

A. Certain materials, as and if noted on the drawings, shall be carefully removed, protected, reused and/or delivered to the Owner for his future use as shown on drawings or specified herein. Extreme care shall be exercised to prevent chipping, breakage, bending and mishandling of all materials. All material not salvaged or to be reused by the Contractor shall become the property of the Contractor and shall be removed promptly from the site at no additional expense to the Owner. Coordination of salvaged material shall occur prior to beginning demolition so as to not hinder the progress of this work.
1. The following materials and/or equipment is to be salvaged by the Contractor and delivered to the Owner's storage area, as and where directed by the Owner.
a. Existing metal bleachers to be removed as indicated on drawings.

3.07 CLEANING

A. On completion of demolition work, leave area and adjacent areas clean and satisfactory to local authorities and the Owner. Areas in use by the Owner shall have all debris caused by this Contractor removed at the end of each work day.

END OF SECTION

PART 1 – GENERAL

1.1 DESCRIPTION

A. This section shall consist of the construction of Concrete Paving at the locations shown on the Plans or as directed by the Engineer.

1.2 STANDARD SPECIFICATIONS

A. Materials, design and placement of Concrete Paving shall be in accordance with SECTION 501 – PORTLAND CEMENT CONCRETE PAVING of the AHTD Standard Specifications.

1.3 TESTS

A. Tests shall be in accordance with Paragraph 13.5, TESTS AND INSPECTIONS, of the AIA General Conditions.

PART 2 - PRODUCTS

2.1 FORMS

A. Article 501.07 of AHTD Standard Specifications shall be augmented as follows:

1. The Engineer shall approve all forms before they are used on the job and shall inspect them periodically. When forms appear to be unsatisfactory in any way, either before forms are used, during forming operations, or during the placing of concrete, the Engineer shall order the work stopped until the defects have been corrected or the defective forms are replaced by satisfactory ones.

PART 3 - EXECUTION

3.1 PLACING AND FINISHING

A. That part of Article 501.05(k) of AHTD Standard Specifications which relates to consolidating and finishing shall be augmented as follows;

1. Contractor methods for placing and finishing shall be submitted and reviewed by the Engineer for compliance with requirements.

3.2 JOINTS

A. Article 501.05(j), of AHTD Standard Specifications for Concrete Paving Joints

1. Locations of longitudinal and transverse joints shall be established and provided for review by the Engineer in a detailed joint plan.

2. Joints shall be normal to the grade and the centerline of the roadway. The location and width of joints shall coincide with those placed in the curb. All joints shall be sealed with material meeting the requirements of SECTION 501 - PORTLAND CEMENT CONCRETE PAVEMENT, Article 501.03(h) of the AHTD Standard Specifications.

END OF SECTION

PART 1-GENERAL

1.1 DESCRIPTION

This item shall consist of the construction of pipe culverts and storm drains in accordance with these specifications and in reasonably close confirmation with the lines and grades shown on the plans.

1.2 MATERIALS

Materials shall meet the requirements shown on the plans and specified below.

1.3 PIPE

Concrete pipe shall be gasket joint water tight pipe. Concrete pipe shall be Class III Reinforced Concrete Pipe, as shown on the plans, and shall conform to the requirements of ASTM C 76.

1.4 RUBBER GASKETS

Rubber gaskets for rigid pipe shall conform to the requirements of ASTM C 443.

1.5 FLARED END SECTIONS

Flared end sections shall be reinforced concrete conforming to the requirements of ASTM C 76.

1.6 CONCRETE

Concrete for flared end section curtain walls shall be in accordance with Item P-610.

1.7 MORTAR

Mortar for making connections to structures shall consist of one part Portland cement and two parts sand. The Portland cement shall conform to the requirements of ASTM C 150 Type I. The sand shall conform to the requirements of ASTM C 144.

PART 2 - CONSTRUCTION METHODS

2.1 EXCAVATION

The width of the pipe trench shall be sufficient to permit satisfactory jointing of the pipe and thorough tamping of the bedding material under and around the pipe but shall not be less than the external diameter of the pipe plus 6 inches on each side. The trench walls shall be approximately vertical. Where rock, hardpan, or other unyielding material

is encountered, the Contractor shall remove itfrom below the foundation grade fora depth of at least 12inches or one-half in for each foot of fill over the top of the pipe, whichever is greater, but not more than three-quarters of the nominal diameter of the pipe. The width of the excavation shall be at least 1 foot greater than the horizontal outside diameter of the pipe. The excavation below the grade shall be backfield with selected fine compressible material, such as silty clay or loam, and lightly compacted in layers not over 6 inches in uncompacted depth to form a uniform by yielding foundation.

Where a firm foundation Is not encountered at the grade established, due to soft, spongy, or other unstable soil, the unstable soil shall be removed and replaced with approved granular material for the full width. The Engineer shall determine the depth of removal necessary. The granular material shall be compacted to provide adequate support for the pipe.

The excavation for pipes that are placed in embankment fill shall not be made until the embankment has been completed to a height above the top of the pipe as shown on the plans.

2.2 BEDD NG

The pipe bedding shall conform to the class specified on the plans. When no bedding class is specified or detailed on the plans, the requirements for Class C bedding shall apply. Class B bedding will be used at the locations designated by the Engineer.

Class B bedding shall consist of the bed of granular material having a thickness of at least 6 inches (150mm) below the bottom of the pipe and extending up around the pipe for a depth or not less than 30 percent of the pipe's vertical outside diameter . The layer of bedding material shall be shaped to fit the pipe for at least 10 percent of the pipe's vertical diameter and shall have recesses shaped to receive the bell and spigot pipe. The bedding material shall be sand or selected sandy soil, all of which passes a 3/8 inch {9mm) sieve and not more than 10percent of which passes a No. 200 (0.075 mm) sieve.

Class C_bedding shall consist of bedding the pipe in its natural foundation to a depth of not less than 10percent of its vertical outside diameter. The bed shall be shaped to fit the pipe and shall have recesses shaped to receive the bell of bell and spigot pipe.

2.3 LAYINGPIPE

The pipe laying shall begin at the lowest point or the trench and proceed upgrade. The lower segment of the pipe shall be in contact with the bedding throughout its full length. Bell of groove ends of rigid pipes shall be placed facing upgrade.

2.4 JOINING PIPE

The concrete pipe may be either bell and spigot or tongue and groove. The method of joining concrete pipe sections shall be such that the ends are fully entered and the inner surfaces are reasonably flush and even. Joints for circular concrete pipe shall be made with rubber ring gaskets to form a flexible watertight seal.

Metal pipe shall be firmly joined by form fitting bands conforming to the requirements of ASTM. A 760 for steel pipe.

2.5 BACKFILLING

Pipes shall be inspected before any backfill is placed and any found to be out of alignment, unduly settled, or damaged shall be removed, and re-laid or replaced at the Contractor's expense.

Materials for backfill shall be fine, readily compactable soil or granular material selected from the excavation or a source of the Contractor's choice. The backfill material shall not contain frozen lumps, stones that would be retained on a 2-inch sieve, chunks of highly plastic clay, or other objectionable material. Granular backfill material shall have not less than 95 percent retained on a No. 4 sieve.

When the top of the pipe is even with or below the top of the trench, backfill shall be compacted in layers, not exceeding 6 inches on both sides of the pipe and to an elevation of one foot above the top of the pipe or to natural ground level whichever is greater. care shall be exercised to thoroughly compact the backfill material under the haunches of the pipe. Material shall be brought up evenly on both sides of the p i p e .

When the top of the pipe is above the top of the trench, the backfill shall be compacted inlayers not exceeding 6 inches and shall be brought up evenly on both sides of the pipe to an elevation 1foot above the top of the trench shall be equal to twice the diameter of the pipe or 12feet whichever is less.

All backfill shall be compacted to the density required under Item P-152 of these specifications.

END OF SECTION

PART 1-GENERAL

1.1 DESCRIPTIONS

This item shall consist of the construction of manholes, drop inlets or junction boxes, with rings and covers or gates and frames, in accordance with these specifications, of this type, size, and dimensions shown on the plans, and in conformity with the locations, lines and grades shown on the plans or as directed by the Engineer.

PART2-PRODUCTS

2.1 MATERIALS

(a) Concrete: All concrete specified in this section shall meet the requirements of Concrete Structures, Section 802 of the Arkansas Highway Construction Specifications. Class "S" concrete, as described in Section 802, shall be used.

(b) Reinforcing Steel: Bar reinforcement shall conform to the requirement of ASTM A-615.

(c) Masonry: All units shall conform to the following requirement:

(1) Clay Brick - AASHO M-114, Grade SW

(2) Concrete Brick - ASTM C-55, Grade A

(3) Concrete Masonry Block - ASTM C-130

(4) Concrete Masonry Block (Hollow) -ASTM C-90, Grade U-11

(5) Structural Tile-ASTM C-34, Grade LBX

(d) Welded Steel Grates; Steel for welded steel grates and frames shall conform to the requirements of ASTM A-36.

(e) cast iron rings, covers, grates and frames, Iron castings for rings, covers, grates, and frames, and other appurtenances, shall conform to the requirements of ASTM A-48, Class 30

A. Bearing surfaces between rings and covers or grates and frames shall be cast or machined with such precision that uniform bearing shall be provided throughout the perimeter area of contract.

PART 3 -EXECUTION

3.1 CONSTRUCTION METHODS

Concrete shall not be poured until the Engineer has inspected the forms and the placement of reinforcing steel and rings or frames.

Concrete floors shall be poured at least 24 hours before beginning construction of the walls. A longer period of time may be required if weather conditions make it necessary.

Walls shall be constructed to form a tight joint with the floor and around the inlet and outlet pipes. Pipes shall be cut flush with the inside surfaces of the wall. Utility lines that are carried through the walls shall be protected in an approved manner to avoid damage. Faces of drop inlets shall be poured as a part of the curb in order to preserve the proper alignment.

Mortar for masonry units shall be mixed in the proportion of 1part Portland Cement to 2 parts concrete sand in a water-tight box until the mixture has a uniform color. Water shall be added as the mixing continues until the mortar has a consistency that can be handled and spread with a trowel.

Mortar that is not used within 30 minutes after water has been added shall be discarded. Retempering of mortar will not be permitted.

Masonry units shall be laid in full courses with full mortar joints nor more than 112 inch wide. Courses shall be level and adjoining courses shall break joints as near 1/2 unit as possible. At least one course in every seven shall be composed of headers. No spalls or bats shall be used except for shaping around irregular openings or when unavoidable to finish out a course. The outside face of walls shall be plastered with a 1/2 inch thick mortar coat.

Metal rings or frames shall be set accurately to the finished elevations so that no subsequent adjustments will be necessary. They shall be set in full mortar bed with firm bearing on the walls or securely fastened to the forms so no movement will occur when concrete is placed around them.

Welded steel grates and frames shall have a shop coat primer and a finished field coat as directed by the Engineer.

Backfill shall be thoroughly settled and compacted by tamping or jetting with water. After the backfill settles, additional fill shall be placed and the operation repeated until no further settlement occurs.

END OF SECTION

PART 1 – GENERAL

1.1

A. Aggregate Base Course - Refer to Section 303 (CLASS 7) of the Arkansas State Highway Commission Standard Specifications

END OF SECTION

PART 1 - GENERAL

Not Used

PART 2 - PRODUCTS

2.01 TRAFFIC MARKING PAINT

A. Manufacturer: Sherwin Williams; Product: TRAFFIC MARKING PAINT.
   1. Substitutions permitted.

B. Color: White, unless otherwise noted on Drawings.

PART 3 - EXECUTION

3.01 EXAMINATION AND PREPARATION

A. Verify that pavement coating work is complete and suitable to receive markings.

B. Clean surfaces to receive pavement marking; allow pavement to cure enough to achieve optimum results.

3.02 PAINTED MARKINGS & SYMBOLS

A. Apply traffic striping, marking, and symbols as shown on Drawings and in accordance with manufacturer’s printed instructions.

B. Parking stripes: 4 inch wide, fully opaque, and applied with commercial type striping machine.

C. Directional markings and symbols: Use templates with sharp, even edges.

3.03 PROTECTION OF FINISHED WORK

A. Do not allow traffic to cross marked areas until paint is dry.

END OF SECTION

PART 1 - GENERAL

1.01 SCOPE OF WORK

A. Furnishing of and paying for all labor, services, appliances, materials, and equipment necessary for execution, installation and completion of all work specified herein and as shown on drawings.

B. Section includes:
   1. All exterior and interior brick masonry including special solid brick window sills and wall cap units where coring would be exposed.
   2. All interior concrete block masonry including concrete fill, reinforcing and conventional mortar for reinforced and non-reinforced masonry.
   3. Common brick
   4. Raking and leaving open of all joints to receive caulking, flashing, etc.
   5. Installation of various materials, devices and anchors furnished by other sections of this specification. Such items are to be installed in masonry work by this section with other sections furnishing materials complete with erection and location information and drawings as required. Refer to Section 01 3900 for coordination.
   6. Portland Cement type mortar (exterior) and masonry cement type mortar (interior)
   7. Grout fill and reinforcing in all metal door and borrowed light frames.
   8. Masonry type ties, reinforcing, and other embeds.
   9. Concrete fill and reinforcing in block work including bond beams.
   10. Any other items or equipment necessary incidental to the completion of all work specified herein.
   11. Furnishing test specimens and samples of material as specified.
   12. Cleaning all masonry units and removing surplus material and waste.
   13. Grout, seal and caulk all interior masonry to steel deck above for sound control.
   14. Granular Masonry Insulation in interior concrete block walls surrounding Holding Rooms as indicated on Drawings.

1.02 REFERENCES

A. The following documents of issue shown or latest issue form a part of this specification to the extent specified herein.
   1. American Concrete Institute (ACI):
      a. Building Code Requirements for Concrete Masonry Structures (ACI 531-79) (latest edition).
   2. National Concrete Masonry Association (NCMA):
      a. Manual of Facts on Concrete Masonry, TEK Series.
      b. Specifications for the Design and Construction of Load-Bearing Concrete Masonry (TR-75B-79).
   3. International Masonry Industry All-Weather Council (IMIAC), International Masonry Institute, Washington, DC - Recommended Practices and Guide Specifications for Cold-Weather Masonry Construction (latest edition).

B. Brick Institute of America (BIA):
   1. BIA-1C - Cold Weather Masonry Construction
   2. BIA-7 REV 7A & 7B REV (latest edition) - Water Resistance, Design and Detailing
   3. BIA-8A - Portland Cement Mortar
   4. BIA-18, 18A, 18B - Differential Movement
   5. BIA-20 REV - Cleaning Brick Masonry
   6. BIA-23 REV & 23A - Efflorescence, Causes, Prevention and Control
   7. BIA-28A - Brick Veneer Existing Construction
   8. BIA-28B REV - Brick Veneer High-rise Construction

9. BIA-28B REV II - Brick Veneer Steel Stud Panel Walls (latest edition)
10. BIA-44B - Wall Ties for Brick Masonry (latest edition)
11. BIA-MI-72 - Standard Specifications for Portland Cement-Lime Mortar for Brick Masonry

C. American Society for Testing and Materials (ASTM):
1. A82 - Steel Wire, Plain, for Concrete Reinforcement
2. A615 - Deformed and Plain Billet-Steel Bars for Concrete Reinforcement
3. C39 - Standard Test Methods for Compressive Strength of Cylindrical Concrete Specimens.
4. C62 - Standard Specification for Building Brick
5. C67 - Standard Methods of Sampling and Testing Brick and Structural Clay Tile
6. C90 - Standard Specification for Hollow Load-Bearing Concrete Masonry Units
7. C91 - Masonry Cement
8. C94 - Ready-Mix Concrete
9. C126 - Standard Specification for Ceramic Glazed Structural Clay Facing Tile, Facing Brick and Solid Masonry Units
10. C129 - Standard Specification for Non-Load-Bearing Concrete Masonry Units
11. C144 - Standard Specification for Aggregate for Masonry Mortar
12. C145 - Standard Specification for Solid Load-Bearing Concrete Masonry Units
13. C150 - Standard Specification for Portland Cement
14. C207 - Standard Specification for Hydrated Lime for Masonry Purposes
15. C216 - Standard Specification for Facing Brick (Solid Masonry Units Made for Clay or Shale
16. C270 - Standard Specification for Mortar for Unit Masonry
17. C404 - Standard Specification for Aggregates for Masonry Grout
18. C476 - Grout for Masonry
19. C780 - Standard Method for Preconstruction and Construction Evaluation of Mortars for Plain and Reinforced Unit Masonry
20. C1019 - Method of Sampling and Testing Grout
21. D1056 - Specification for Flexible Cellular Materials - Sponge or Expanded Rubber
22. D2000 - Classification System for Rubber Products in Automotive Applications
23. E84 - Test Method for Surface Burning Characteristics of Building Materials

D. In the event of conflict between documents referenced herein and other detail content of this specifications, the detail content herein shall be considered a superseding requirement.

1.03 SUBMITTALS

A. Submit under provisions of Section 01 3000.

B. Product Data: Provide data on face brick, concrete block, reinforcement, anchorage, ties, and accessories.

C. Samples: Submit two (2) samples of each face brick to illustrate color, texture and extremes of color range.

D. Design Mix: Indicate Proportion or Property Method used, required environmental conditions, and admixture limitations.

E. Shop drawings for reinforcing detailing fabrication, bending, and placement of unit masonry reinforcing bars. Comply with ACI 315 “Details and Detailing of Concrete Reinforcement” showing bar schedules, stirrup spacing, diagrams of bent bars, and arrangement of masonry reinforcement.

F. Material certificates for the following, signed by manufacturer and Contractor certifying that each material complies with requirements.
   1. Each different cement product required for mortar and grout including name of manufacturer, brand, type, and weight slips at time of delivery.
   2. Each material and grade indicated for reinforcing bars.
   3. Each type and size of joint reinforcement.
   4. Each type and size of anchors, ties, and metal accessories.

1.04 QUALITY ASSURANCE

A. Testing Agency Qualifications: To qualify for acceptance, an independent testing agency must demonstrate to Architect-Engineer's satisfaction, based on evaluation of agency-submitted criteria conforming to ASTM C 1093, that it has the experience and capability to satisfactorily conduct the testing indicated without delaying the Work.

B. Preconstruction Testing: Employ and pay a qualified independent testing agency to perform the following pre-construction testing to establish compliance of proposed materials and construction with specified requirements:
   1. Test mortar properties per test methods of ASTM C 270.
   2. Test grout compressive strength per ASTM C 1019.

C. Fire-Resistance Ratings: Where indicated, provide materials and construction identical to those of assemblies with fire resistance rating determined per ASTM E 119 by a testing and inspecting agency, by equivalent concrete masonry thickness, or by another means, as acceptable to authorities having jurisdiction.

D. Single-Source Responsibility for Mortar Materials: Obtain mortar ingredients of a uniform quality, including color for exposed masonry, from one manufacturer for each cementitious component and from one source or producer for each aggregate.

1.05 PROJECT RECORD DOCUMENTS

A. Submit under provisions of Section 01 7200.

B. Submittals

C. Certifications

D. Test Reports

1.06 REGULATORY REQUIREMENTS

A. Conform to UL Assembly requirements for fire-rated masonry construction where shown on drawings.

1.07 MOCKUP PANEL

A. Provide mockup panel under provisions of Section 01 4000.

B. After approval of Type A and B masonry (face brick), erect a 4 ft -0 in. wide by 5 ft - 4 in. high minimum sample panels at job site with all laid together in similar configuration to that shown on drawings including horizontal joint between all types and wall backup systems. Panel to be completed in conjunction with sample of CMU backup with insulation in cavity joints. Include mortar with colors specified, dampproofing, masonry anchors or ties, tolerances, joint spacing, tooling of joints and alignment.

C. Upon satisfactory fabrication of the sample panels as approved by the Architect, the erected units shall become the standard of workmanship to which all subsequent work shall conform. Any work not conforming to the sample will be replaced without additional cost to the Owner.

1.08 DELIVERY, STORAGE AND HANDLING

A. Deliver, store, protect and handle product to site under provisions of Section 01 6000.

B. Deliver material to job site in undamaged condition.

C. Handle concrete masonry unit to prevent damage.

D. Store material off ground to prevent contamination by mud, dust, or materials likely to cause staining or other defects.

E. Deliver cementitious materials in original manufacturer's containers. Store in weathertight enclosure.

F. Cover materials as necessary to protect from elements or contamination.

G. Protect anchors, ties and reinforcement from elements.

H. Store aggregates in a manner to avoid contamination, segregation, and mixing with other size aggregate or other materials.

1.09 ENVIRONMENTAL CONDITIONS

A. Maintain materials and surrounding air temperatures to minimum 50 degrees F prior to, during, and 48 hours after completion of masonry work.

B. Protection of Masonry: During erection, cover tops of walls, projections, and sills with waterproof sheeting at end of each day’s work. Cover partially completed masonry when construction is not in progress.
   1. Extend cover a minimum of 24 inches (600 mm) down both sides and hold cover securely in place.
   2. Where one wythe of multi-wythe masonry walls is completed in advance of other wythes, secure cover a minimum of 24 inches (600 mm) down face next to unconstructed wythe and hold cover in place.
   3. Walls not covered as noted above are to be removed entirely and replaced.

C. Do not apply uniform floor or roof loads for at least 12 hours and concentrated loads for at least 3 days after building masonry walls.

D. Stain Prevention: Prevent grout, mortar, and soil from staining the face of masonry to be left exposed or painted. Immediately remove grout, mortar, and soil that come in contact with such masonry.
   1. Protect base of walls from rain-splashed mud and mortar splatter by coverings spread on ground and over wall surface.
   2. Protect sills, ledges, and projections from mortar droppings.
   3. Protect surfaces of window and door frames, as well as similar products with painted and integral finishes, from mortar droppings.
   4. Turn scaffold boards near the wall on edge at the end of each day to prevent rain from splashing mortar and dirt on completed masonry.

E. Cold-Weather Requirements: Do not use frozen materials or materials mixed or coated with ice or frost. Do not build on frozen subgrade or setting beds. Remove and replace unit masonry damaged by frost or freezing conditions. Comply with the following requirements:

1. Cold-Weather Construction: When the ambient temperature is within the limits indicated, use the following procedures:
   a. 40 to 32 deg. F (4 to 0 deg. C): Heat mixing water or sand to produce mortar temperatures between 40 and 120 deg.. F (4 and 49 dig C).
   b. 32 to 25 deg. F (0 to -4 deg. C): Heat mixing water and sand to produce mortar temperatures between 40 and 120 deg. F (4 and 49 deg. C). Heat grout materials to produce grout temperatures between 40 and 120 deg. F (4 and 49 deg. C). Maintain mortar and grout above freezing until used in masonry.
   c. 25 to 20 deg. F (-4 to -7 deg. C): Heat mixing water and sand to produce mortar temperatures between 40 and 120 deg.. F (4 and 49 deg. C). Heat grout materials to produce grout temperatures between 40 and 120 deg. F (4 and 49 deg. C). Maintain mortar and grout above freezing until used in masonry. Heat masonry units to 40 deg. F (4 deg. C) if grouting. Use heat on both sides of walls under construction.
   d. 20 deg. F (-7 deg. C) and Below: Heat mixing water and sand to produce mortar temperatures between 40 and 120 deg. F (4 and 49 deg. C). Heat grout materials to produce grout temperatures between 40 and 120 deg. F (4 and 49 deg. C). Maintain mortar and grout above freezing until used in masonry. Heat masonry units to 40 deg. F (4 deg. C). Provide enclosures and use heat on both sides of walls under construction to maintain temperatures above 32 deg. F (0 deg. C) within the enclosures.
2. Cold-Weather Protection: When the mean daily temperature is within the limits indicated, provide the following protection:
   a. 40 to 25 deg. F (4 to -4 deg. C): Cover masonry with a weather-resistant membrane for 48 hours after construction.
   b. 25 to 20 deg. F (-4 to -7 deg. C): Cover masonry with insulating blankets or provide enclosure and heat for 48 hours after construction to prevent freezing. Install wind breaks when wind velocity exceeds 15 mi./h (25 km/h).
   c. 20 deg. F (-7 deg. C) and Below: Provide enclosure and heat to maintain temperatures above 32 deg. F (0 deg. C) within the enclosure for 48 hours after construction.
3. Cold-Weather Cleaning: Use liquid cleaning methods only when air temperature is 40 deg. F (4 deg. C) and above and will remain so until masonry has dried out, but not less than 7 days after completion of cleaning.

F. Hot-Weather Requirements: Protect unit masonry work when temperature and humidity conditions produce excessive evaporation of water from mortar and grout. Provide artificial shade and wind breaks and use cooled materials as required. Do not apply mortar to substrates with temperatures of 100 deg. F (38 deg. C) and above.

1.10 COORDINATION

A. Coordinate work under provision of Section 01 3900.

B. Coordinate the work between subcontractors installing products under Section 05 1000, 05 1200, 07 6500, Division 15 and 16, and all other subcontractors, separate contractors or parties to this work as essential and required under this Section.

PART 2 - PRODUCTS

2.01 FACE BRICK

A. To be selected by the Architect.
   1. Refer to Project Manual Section 01 0200 for Brick Veneer Allowance.
      a. Modular size of 3-1/2 by 2-1/4 by 7-5/8 inches
      b. ASTM C216, Grade SW, Type FBS
      c. Minimum compressive strength of 8,000 psi

B. All face brick shall be from one manufacturer.

C. Substitution: Under provisions of Section 01 6000.

2.02 BUILDING BRICK (COMMON BRICK)

A. May be standard or modular, meeting ASTM C62 grade MW. Use in unexposed locations. Do not use to piece out concrete block.

2.03 CONCRETE MASONRY UNITS

A. Hollow Load Bearing Block Units: Two core blocks conforming to ASTM C90, Grade N, Type I Moisture Controlled to maximum of 30% at time of delivery, light weight. f'm = 1900 psi per ASTM E447.

B. Solid Load Bearing Block Units: ASTM C145, Grade N, Type I Moisture Controlled to maximum of 30% at time of delivery.

C. Hollow or Solid Non-Load Bearing Block Units: Two core blocks conforming to ASTM C129, Grade N, Type I Moisture Controlled to maximum of 30% at time of delivery, light weight, f'm = 1900 psi per ASTM E447

D. All concrete masonry units where designated within fire-rated masonry walls shall be Fire-rated bearing UL Designation and/or other equivalent independent testing agency approved by Regulatory Code Agencies.

E. Provide special shapes where required for lintels, corner jambs, headers, bond beams and other special conditions. Use 4", 6", 8" or 12" units where shown on drawings and/or required during construction. Conventional units to be 15-5/8" x 7-5/8" x 7-5/8" with two (2) cores.

F. Provide special shapes where required for lintels, corner jambs, headers, bond beams and other special conditions.

G. Obtain all masonry units from one manufacturer for uniform texture.

2.04 REINFORCEMENT AND ANCHORAGE

A. Brick to Block:
1. "Dur-O-Eye" or approved equivalent, D/A 370S, Seismic Dur-O-Eye, standard weight hot dipped galvanized Ladur with Seismic Tie Eye Section welded on at 16 inch centers. Provide rectangular type Pintle for 3" embedment. The overall assembly width shall be approximately 2 inches less than nominal wall width. Provide matching "L" and "T" units.
2. Use in all brick to block masonry walls with concrete block backup. Space 16 inches o.c. starting 8 inches above footing and continuing full wall height. Place in first course over all openings and extend 2'-0" minimum each side of openings. Install per seismic instructions from manufacturer.

B. Block (only) and/or Brick (only):

1. "Dur-O-Wal", or approved equivalent, standard weight hot dipped galvanized truss type with width 2 inches less than wall thickness. Space 16 inches o.c. starting 8 inches above floor and continue to full wall height. Place in first course over all openings and extend 2'-0" minimum each side of openings. Provide matching "L" and "T" units.
2. Use in all concrete block and/or brick free standing walls and/or parapets.

C. Brick or Block to Steel Column:
   1. "Dur-O-Wal" Column Seismic Anchors or approved equivalent in 12 gauge or 1/4 inch diameter in standard hot dipped galvanized bright finish with Triangle Ties in standard 3/16 inch diameter hot dipped galvanized wire by length required. Weld to steel columns.
   2. Spaced 16 inches o.c. vertically. Provide in proper length for minimum 3 inches brick embedment.

D. Reinforcement Bars in Seismic Walls:
   1. Provide deformed bars of following grades complying with ASTM A 615, except as otherwise indicated.
      a. Provide Grade 60 for bars No. 3 to No. 18, except as otherwise indicated.
      b. Where No. 2 bars are shown, provide plain, round, carbon steel bars, ASTM A 675, Grade 80.
      c. Shop-fabricate reinforcement bars which are shown to be bent or hooked, unless shown to be field-bent on plans.

E. Other Ties: Per BIA requirements (Standard of Industry) as approved by the Architect for Seismic application.

2.05 FLASHING

A. As specified in Section 07 6500.

2.06 RIGID ANCHORS

A. General: Fabricate from steel bars as follows:
   1. 1-1/2 inches (38 mm) wide by 1/4 inch (6.4 mm) thick by 12 inches (300 mm) long, with ends turned up 3 inches (75 mm).

2.07 MISCELLANEOUS ANCHORS

A. Anchor Bolts: Steel bolts complying with ASTM A 307, Grade A (ASTM F 568, Property Class 4.6); with ASTM A 563 (ASTM A 563M) hex nuts and, where indicated, flat washers; hot-dip galvanized to comply with ASTM A 153, Class C; of diameter and length indicated and in the following configurations:
   1. Headed bolts.

2.08 MISCELLANEOUS MASONRY ACCESSORIES

A. Compressible Filler: Premolded filler strips complying with ASTM D 1056, Type 2, Class A, Grade 1; compressible up to 35 per cent; of width and thickness indicated; formulated from the following material:
   1. Neoprene.

B. Preformed Control-Joint Gaskets: Material as indicated below, design to fit standard sash block and to maintain lateral stability in masonry wall; size and configuration as depicted on the Drawings.
   1. Wide-flange PVC complying with ASTM D2287, Type 654-4, with a Durometer hardness of 85±5 when tested in accordance with ASTM D2240.
   2. Provide with corner and tie accessories cement fused joints.
   3. Provide at all interior and exterior expansion and control joints in unit masonry as depicted on the Drawings.

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

D. Cell Vent: Dur-O-Wall No. D/A 1006.

E. MortarNet for Cavity Wall Installations: Product: to compliance with requirements, provide trapezoidal shaped MortarNet as manufactured by MortarNet Solutions®, 326 Melton Road, Burns Harbor, IN 46304.

1. The trapezoidal shaped MortarNet is a 90% open mesh, 2” (50.8 mm) polyester, 1” (25.4 mm) or 0.4” (10.16 mm) nylon thickness.
2. Provide trapezoidal shaped MortarNet to suspend mortar droppings at unequal heights allowing moisture to drain from the cavity and maintain airflow within the cavity wall.

2.09 MORTAR

A. Portland Cement (Exterior Masonry):
1. ASTM C150, Type 1, Standard American Brand: Gray

B. Masonry Cement (Interior Masonry): ASTM C91

C. Lime (Exterior Masonry): ASTM C207, Type S, American Standard Brand, hydrated finished type.

D. Mortar Aggregate:
1. All sand for masonry work shall conform to ASTM C144.
   a. For joints 3/8 inch and larger - White, graded as follows:
      100 percent passing #8 screen - 30 percent passing #50 screen
   b. For joints less than 3/8 inch - White, graded as follows:
      100 percent passing #16 screen - 40 percent passing #50 screen

E. Grout Aggregate: ASTM C404

F. Water: Clean, drinkable from City water mains

2.10 MORTAR COLOR

A. To be pigment non-fading alkali resistant equivalent to Solomon Grind-Chem Service “H” Series specifically for Portland and lime mortar mixes. Use approximately three (3) units per sack of cement.
1. A Brick - Allow for one (1) color to be selected form manufacturers standard colors.

2.11 ADMIXTURES

A. All admixtures must be approved in writing by the Architect prior to use.

2.12 MORTAR MIXES

A. Mortar for all masonry and brick walls: ASTM C270 Type M using the Property Method to achieve 2500 psi in 28 days for below grade. Type S using the Property Method to achieve 1800 psi in 29 days for all other applications.

B. Use Portland cement mixtures only for exterior work.

C. Use masonry cement mixtures only for interior work.

2.13 MORTAR MIXING

A. Thoroughly mix mortar ingredients in quantities needed for immediate use in accordance with ASTM C270.

B. The method of measurement of materials shall be such that the specified proportions of the material can be controlled and accurately maintained in accordance with the applicable mixing requirements. (Shovel is not acceptable.)

C. If water is lost by evaporation, retemper only within two hours of mixing.

D. All mixing boards, mixing equipment and batching devices shall be kept clean at all times.

2.14 GROUT MIXES

A. Grout for Unit Masonry: 3000 psi at 28 days mixed in accordance with ASTM C476. Use grout of consistency indicated or, if not otherwise indicated, of consistency (fine or coarse) at time of placement that will completely fill spaces intended to receive grout.
   1. Use fine grout in grout spaces less than 2 inches (50 mm) in horizontal dimension unless otherwise indicated.
   2. Use coarse grout in grout spaces 2 inches (50 mm) or more in least horizontal dimension unless otherwise indicated.

2.15 GROUT MIXING

A. Mix grout in accordance with ASTM C94.

2.16 CONCRETE FILL

A. Concrete Fill in Bond Beams and other locations as indicated on Structural Drawings to be 3000 psi concrete per Section 03 301

2.17 CLEANING AGENTS

A. Face Brick: As recommended by brick manufacturer.

B. Concrete Masonry Units: Use no cleaning agent other than water on masonry surface unless approved by the Architect.

C. Substitution: Under provisions of Section 01 6000.

2.18 QUALITY CONTROL

A. Mortar Testing:
   1. Testing of Mortar Mix: ASTM C780
   2. Test mortar mix for compressive strength, consistency, mortar aggregate ratio, water content, air content, and splitting tensile strength.
   3. Testing Laboratory shall conduct a minimum of one test per 1000 bricks laid.

B. Grout Testing (ACI 531.1 Sect. 4):
   1. When required, make grout tests by the following procedure on samples taken at the site during construction.
      a. Place masonry units having same moisture condition as those being placed on non-absorptive base to form a void for a square prism with a height twice the side and a minimum side of 3 inches.

b. Line the side faces of the prism with permeable paper (such as paper towel) or porous separator to allow water passage through liner into masonry units.
c. Fill prism with a fully representative grout sample in two layers with each layer puddled with a puddle stick approximately 1 inch by 2 inch to eliminate air voids.
d. Level off specimen and maintain in a damp condition.
e. After 48 hours, remove masonry units and ship prisms to laboratory and store in fog room until testing.
f. Cap and make compressive strength test with prism in vertical position in accordance with applicable provisions of ASTM C39.

2. Testing Laboratory shall conduct a minimum of one test per 5000 square feet of wall area or portion thereof.

2.19 WEEPS

A. Weeps shall be equal to QV-Quadro-vent, by Hohmann & Barnard, Inc. Colors to be selected by Architect.

2.20 WEATHER SEAL

A. Weather seal for masonry and grout shall be equal to Siloxana PD by PROSOCO,INC. Install per manufacturer's recommendations.

PART 3 - EXECUTION

3.01 EXAMINATION

A. Verify that field conditions are acceptable and are ready to receive work.

B. Verify items provided by other sections of work are properly sized and located.

C. Verify that built-in items are in proper location and ready for roughing into masonry work.

D. Replace any insulation damaged in transit or handling.

E. Beginning of installation means installer accepts existing conditions.

3.02 PREPARATION

A. Direct and coordinate placement of metal anchors supplied by other sections.

B. Provide temporary bracing during installation of masonry work. Maintain in place until building structure provides permanent bracing.

C. Brick: Verify that initial absorption rate of brick is within acceptable limits. Reduce initial absorption of brick by thoroughly wetting brick with clean water 24 hours prior to placement. Brick shall not be wet when laid.

D. Reinforcement and Anchors: Remove all dirt, ice, loose rust and scale prior to installation.

3.03 COURSING

A. Establish lines, levels, and coursing indicated. Protect from displacement.

B. Maintain masonry courses to uniform dimension. Form vertical and horizontal joints of uniform thickness.

C. Concrete Masonry Units: Lay concrete masonry units in running bond. Course one unit and one mortar joint to equal 16 inches with joint below and above at center of each unit. Form 3/8 inch concave tooled mortar joints.

D. Face Brick: Lay brick units in running stretcher bond. Course three brick units and three mortar joints to equal 8 inches vertically and 24 inches horizontally. Form a 3/8 inch tooled concave mortar joint. Brick vertical joints are to center on the brick below and run alternately to top of wall. Maximum variation 1/8 inch.

3.04 PROTECTION OF WORK

A. Protect sills, ledges, and offsets from mortar drippings or other damage during construction.

B. Remove misplaced mortar or grout immediately. Protect face materials against staining.

C. Protect the door jambs and corners from damage during construction.

3.05 PLACING AND BONDING

A. Do not install cracked, broken, or chipped masonry units.

B. Lay solid masonry units in full bed of mortar, with full head joints, uniformly jointed with other work.

C. Lay hollow masonry units with face shell bedding on head and bed joints.

D. Buttering corners of joints or excessive furrowing of mortar joints are not permitted.

E. Remove excess mortar as work progresses.

F. Interlock intersections and external corners except exterior inside corners. Refer to 3.12.A.1.

G. Do not shift or tap masonry units after mortar has achieved initial set. Where adjustment must be made, remove mortar and replace.

H. Perform job site cutting of masonry units with proper tools to provide straight, clean, unchipped edges. Prevent broken masonry unit corners or edges.

I. Cut mortar joints flush where waterproofing and/or ceramic tile are shown on drawings.

J. Isolate masonry partitions from vertical structural framing members with a control joint as indicated.

K. Isolate top joint of non-load bearing masonry partitions from horizontal structural framing members and slabs or decks with compressible joint filler.

L. Top joint of masonry partitions abutting structural framing members and decks shall be sealed for sound control with grout and caulked full perimeter with Sound Control Caulking.

M. All new brick and/or concrete block shall be keyed into existing brick or block at all locations except where an expansion joint or concrete column s specifically indicated to be installed.

N. All existing brick and/or block in area of new work shall be patched, replaced or repointed where visible damage in the form of cracks, separations, voides, etc, now exists to match existing color and arrangements.

O. All new work shall match.

P. Place granular masonry insultaion full height in all interior walls within all CMU core holes around all Holding and Segregation Rooms as shown on Drawings.

Q. Use solid brick at ends of window sills, etc. to prevent holes in brick from being exposed.

3.06 WEEPS

A. Install weeps in head joints 24 inches o.c. horizontally in first course immediately above flashing.

B. Keep weep holes and area above flashing free of mortar droppings.

3.07 CAVITY WALL

A. Do not permit mortar to drop or accumulate into cavity air space or to plug weep holes.

3.08 REINFORCEMENT AND ANCHORAGES - VENEER MASONRY

A. Secure veneer anchors thru sheathing and membrane vapor barrier to steel stud backup and embed into masonry veneer 3” minimum at maximum 16 inches vertically and horizontally. Additional anchors to be installed within 8 inches of all jamb openings of doors, window frames, outside and inside building corners and expansion joints. All anchors must be seismic rated and installed accordingly.

B. All anchors shall be embedded in the bed joints 3/4 inch from the outer face of masonry units and securely attached to the steel studs using the specified screws thru the sheathing and vapor retarder.

3.09 REINFORCEMENT AND ANCHORAGES (REINFORCED AND NON-REINFORCED CONCRETE MASONRY UNITS)

A. Install horizontal joint reinforcement 16 inches o.c.

B. Place masonry joint reinforcement in first horizontal joint above openings. Extend minimum 24 inches each side of opening.

C. Place joint reinforcement continuous in first joint below top of walls.

D. Lap joint reinforcement ends minimum 6 inches.

E. Support and secure reinforcing bars from displacement. Maintain position within 1/2 inch of dimensioned position.

3.10 MASONRY FLASHINGS

A. Reference Section 07650.

3.11 LINTELS

A. Install reinforced unit masonry lintels and steel lintels over openings as scheduled on drawings.

B. Provide reinforcing as scheduled.

C. Use single piece reinforcing bar only.

3.12 GROUTED AND REINFORCED HOLLOW UNIT MASONRY

A. General: Grouted and reinforced hollow unit masonry is defined as hollow masonry units in which certain or all cells are continuously filled with grout and in which reinforcement is embedded. Requirements shall be as follows:
   1. All units shall be laid with full mortar beds on the face shells. All head joints shall be filled solidly with mortar for a distance in from the face of the unit not less than the thickness of the longitudinal face shells.
   2. Only Type S mortar consisting of Portland cement, lime and aggregate shall be used.
   3. End walls and cross webs forming cells to be filled shall be full bedded in mortar to prevent leakage of grout unless the wall is to be poured solid.
   4. Bond shall be provided by lapping units in successive vertical courses or by equivalent mechanical anchorage.
   5. Vertical cells to be filled shall have vertical alignment sufficient to maintain a clear, unobstructed continuous vertical cell measuring not less than 2 inches by 3 inches. If walls are battered or if alignment is offset, the 2 inches by 3 inches clear opening shall be maintained as measured from course to course. Excessive mortar fins and any other obstructions shall be removed from the cells to be grouted.
   6. At the time of laying, all masonry units shall be free of excessive dust and dirt.
   7. All cells containing reinforcement shall be filled solidly with grout. Grout shall be a workable mix suitable for pumping without segregation and shall be thoroughly mixed. Grout shall be placed by pumping or an approved alternate method and shall be placed before initial set or hardening occurs. Grout shall be consolidated by puddling or mechanical vibration during placing and reconsolidated after excess moisture has been absorbed but before workability is lost. The grouting of any section of a wall shall be completed in one day with no interruptions greater than one hour.
   8. Where the grout pour exceeds 4 feet in height, cleanouts shall be provided by suitable openings in the face shells in the bottom course of each cell to be grouted, or other approved locations. The cleanouts shall be sealed after inspection and before grouting.
   9. When the grouting is stopped for one hour or longer, horizontal construction joints shall be formed by stopping the pour of grout approximately 1-1/2 inches below a bed joint.
   10. All reinforcing shall be in place prior to grouting. Vertical reinforcing bars shall be held in position at the top, bottom and at intervals not farther apart than 192 bar diameters.

B. Reinforcement:
   1. General - All reinforcement shall be accurately cut to length and bent by such methods as will prevent injury to the material. All kinks or bends in the bars caused by handling incident to delivery shall be straightened out without injury to the material before placing it in the masonry.
   2. Joint Reinforcement - Masonry joint reinforcement shall be placed so that longitudinal wires are located over face shell mortar beds and are fully embedded in mortar for their entire length with minimum mortar cover of 5/8 inch exposed face of walls. Reinforcement at openings shall extend not less than 24 inches beyond the end of the sills or lintels or to the end of the panel if the distance to the end of the panel is less than 24 inches. Reinforcement shall not be continuous through control joints. Reinforcement shall be lapped 6 inches or more. Factory-fabricated sections shall be installed at corners and wall intersections.
   3. Placing Reinforcement:
      a. Minimum Bar Spacing - The minimum clear distance between parallel bars except in columns shall be equal to the nominal diameter of the bar.
      b. Splices in Reinforcement - Splices may be made only at such points and in such manner that the structural strength of the member will not be reduced. Lapped splices shall provide sufficient lap to transfer the working stress of the reinforcement by bond and shear. Minimum lap shall be 48-bar diameters. Welded or mechanical connections shall develop the strength of the reinforcement.

c. Protection for Reinforcement - All bars shall be completely embedded in mortar or grout. All reinforcement shall have a coverage of masonry not less than the following:
   1) 3 inches for bottom of footings.
   2) 2 inches on vertical members where masonry is exposed to action of weather or soil for bars 5/8 inch and 1-1/2 inches for bars 5/8 inch or less.
   3) 1-1/2 inches for all reinforcement in columns.
   4) 1-1/2 inches on the bottom and sides of beams or girder.
   5) 3/4 inch from the faces of all walls not exposed to action of weather or soil.
   6) 1-bar diameter over all bars, but not less than 3/4 inch at the upper faces on any member, except where exposed to weather or soil in which cases the minimum coverage shall be 2 inches or 3 inches respectively.
   7) Reinforcement consisting of bars or wire 1/4 inch or less in diameter embedded in the horizontal mortar joints shall have not less than 5/8 inch mortar coverage at exposed face of wall.
   8) The thickness of grout or mortar between masonry units and reinforcement shall be not less than 1/4 inch except that 1/4 inch bars may be laid in 1/2 inch horizontal mortar joints, and No. 6 gauge or smaller wires may be laid in 3/8 inch horizontal joints. Vertical joints containing both horizontal and vertical reinforcement shall be not less than 1/2 inch larger than the sum of the diameters of the horizontal and vertical reinforcement contained therein.

3.13 CONTROL JOINTS

A. Interior and Exterior:
   1. In all interior masonry walls, leave one straight vertical joint, through back-up, full height of wall, free of mortar in each approximate 20 lineal feet of wall, or 20 lineal feet each way from a corner, not otherwise interrupted, for packing and caulking of each exposed face. Arrange pattern as shown on drawings or as directed by the Architect.
   2. Where masonry surfaces abut concrete walls, columns and/or other dissimilar materials, relief joints shall be left free of mortar full height for caulking.
   3. In exterior masonry walls, provide open control joint in face brick at all inside corners, typical.

3.14 BUILT-IN WORK

A. As work progresses, build in metal door and glazed frames, anchor bolts, plates and other items furnished by other sections.
   1. All steel door frames and borrowed light frames shall be filled solid with grout as laying progresses. Fill head flush.

B. Build in items plumb and level.

C. Bed anchors of metal doors and glazed frames in adjacent mortar joints. Fill frame voids solid with grout.

D. Solidly grout spaces around built-in items.

E. Provide outside joint around exterior door and window frames and other framed wall openings:
   1. Width: 1/4 inch to 3/8 inch.
   2. Rake and tool smooth to a uniform depth of 1/2 inch.

3.15 TOLERANCES

A. Maximum variation from plumb: 1/4 inch in l0 feet (non-cumulative).

B. Maximum variation from level or grades for exposed lintels, sills, parapets, horizontal grooves and other conspicuous lines: 1/4 inch in 20 feet. (non-cumulative).

C. Maximum variation of linear building line from an established position in plan and related portions of columns, walls and partitions: 1/2 inch in any bay or 20 feet. (non-cumulative).

D. Maximum variation in cross-sectional dimensions of columns in thickness of walls: Not less than 1/4 inch smaller nor more than 1/4 inch larger.

3.16 POINTING AND CLEANING

A. Keep work clean during laying, particularly concrete block which shall be brushed and/or wiped clean as laying progresses per manufacturer's instructions. Remove all mortar droppings on all work at least daily. Keep mortar from contacting other work.

B. When work is complete, point all exposed masonry, filling all holes, defects, etc., remove all loose mortar, cut out defective joints and repoint if required.

C. Accomplish final cleaning as follows: All cleaning operations shall start at the top and work down.
   1. Concrete Block:
      a. Clean all concrete block with stiff fiber brushes. Use water if necessary. Clean closely behind before mortar has taken final set. Use no acid.
   2. Brick:
      a. Brick surfaces shall be cleaned using approved masonry cleaners in full accord with the manufacturer's written instructions.
      b. Use adequate precautions to protect metal or other parts against injury by the cleaning material.
      c. Surface to be cleaned shall be thoroughly soaked with clear water prior to application to prevent absorption and mortar stain. Apply with stiff fiber brushes.
      d. Solution is not to be applied, at any one time, to any area greater than 20 sq. ft. before the surface is immediately and thoroughly scrubbed and rinsed with clear water. It is important to remove all traces of cleaning material before it attacks the mortar joints.
      e. Provide adequate protection for interior brick cleaning.

3.17 CLEANING

A. Remove all material, scrap, etc. from site and clean up all residue from this work.

END OF SECTION

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Architectural cast stone concrete masonry veneer.

1.02 REFERENCES

A. ASTM A 615/A 615M - Deformed and Plain Billet-Steel Bars for Concrete Reinforcement.

B. ASTM A767/A767M - Zinc-Coated (Galvanized) Steel Bars for Concrete Reinforcement.

C. ASTM C 33 - Concrete Aggregates.

D. ASTM C 90 - Loadbearing Concrete Masonry Units.

E. ASTM C 140 - Sampling and Testing Concrete Masonry Units and Related Units.

F. ASTM C 150 - Portland Cement.

G. ASTM C 270 - Mortar for Unit Masonry.

H. ASTM C 426 - Linear Drying Shrinkage of Concrete Masonry Units.

I. ASTM C 494 - Chemical Admixtures for Concrete.

J. ASTM C 666 - Resistance of Concrete to Rapid Freezing and Thawing.

K. ASTM C 979 - Pigments for Integrally Colored Concrete.

L. ACI 530 “Building Code Requirements for Masonry Structures”

1.03 DEFINITIONS

A. Concrete Masonry Veneer Units: An architectural cast stone concrete masonry veneer units manufactured to copy fine grain texture and color of natural cut stone. Meets ASTM C 90 requirements.

B. Dry Cast Concrete Products: Manufactured from zero-slump concrete.

C. Machine Casting Method: Vibratory compaction by machine of earth-moist, zero-slump concrete against rigid mold until it is densely compacted.

1.04 SUBMITTALS

A. Comply with Section 01 3000 - Submittal Procedures.

B. Product Data: Submit manufacturer's product data.

C. Shop Drawings: Submit manufacturer's shop drawings, including profiles, cross sections, modular unit lengths, reinforcement, exposed faces, anchors and anchoring method recommendations, and annotation of concrete masonry veneer unit types and location.

D. Samples: Submit pieces of manufacturer's cast stone veneer masonry units that represent general range of texture and color proposed to be furnished for project.

E. Test Results:
1. Submit manufacturer's test results from cast stone concrete masonry veneer units previously made by manufacturer using materials from same sources proposed for use in project.

F. Manufacturer's Project References: Submit list of projects similar in scope, including project name and location, name of architect, and type and quantity of cast stone concrete masonry veneer units installed.

G. Warranty: Submit manufacturer's standard warranty.

1.05 QUALITY ASSURANCE

A. Manufacturer Qualifications:
1. Sufficient plant facilities to provide quality, shapes, quantities, and sizes of cast stone concrete masonry veneer units required without delaying progress of the Work.
2. Minimum of 10 years experience in producing masonry units.
3. Manufacturer shall have an internal Quality Assurance Testing Program with certified laboratory technician(s).

B. Mock-Ups: Provide full-size cast stone concrete masonry units for use in construction of mock-ups. Approved mock-ups shall become the standard for appearance and workmanship for project.

1. Mock-ups shall remain as part of the completed Work.

1.06 DELIVERY, STORAGE, AND HANDLING

A. Delivery:
1. Deliver cast stone concrete masonry veneer units secured to shipping pallets and protected from damage and discoloration.
2. Provide itemized shipping list.
3. Number each piece individually, as required, to match shop drawings and schedules.

B. Storage:
   1. Store cast stone concrete masonry veneer units and installation materials in accordance with manufacturer's instructions.
   2. Store cast stone concrete masonry veneer units on pallets with nonstaining, waterproof covers.
   3. Do not double stack pallets.
   4. Ventilate units under covers to prevent condensation.
   5. Prevent contact with dirt and splashing.

C. Handling:
   1. Protect cast stone concrete masonry veneer units, including corners and edges, during storage, handling, and installation to prevent chipping, cracking, staining, or other damage.
   2. Handle long units at center and both ends simultaneously to prevent cracking.
   3. Do not use pry bars or other equipment in a manner that could damage units.

1.07 SCHEDULING

A. Schedule and coordinate production and delivery of cast stone concrete masonry veneer units with unit masonry work.

PART 2 PRODUCTS

2.01 MANUFACTURER

A. Reading Rock, Inc., 4600 Devitt Drive, Cincinnati, Ohio 45246. Toll Free (800) 482-6466. Phone (513) 874-2345. Fax (513) 874-2361. Web Site www.readingrock.com. E-Mail info@readingrock.com.

2.02 ARCHITECTURAL CAST STONE CONCRETE MASONRY VENEER UNITS

A. Architectural Cast Stone Concrete Masonry Veneer Units: RockCast Architectural Masonry Veneer.

B. Compliance: ASTM C 90.

C. Casting Method: Machine.

D. Texture: As indicated on the drawings.

E. Color: As indicated on the drawings.

F. Units: As indicated on the drawings.

G. Test Results:
   1. Compressive Strength, ASTM C 140: Typical RockCast Architectural Masonry Veneer series compressive strength range is 4,000 - 6,000 psi at 28 days.

2. Absorption, ASTM C 140: Less than 6 percent at 28 days.
3. Linear Shrinkage, ASTM C 426: Maximum .065 percent.
4. Density, ASTM C 140: Greater than 120 pounds per cubic foot.
5. Freeze-Thaw, ASTM C 666: Less than 5 percent cumulative mass loss after 300 cycles.

H. Curing: Cure in enclosed chamber at 95 percent relative humidity and 95 to 120 degrees F for 12 to 18 hours and yard cure for 350 degree-days.

2.03 ARCHITECTURAL CAST STONE CONCRETE MASONRY VENEER UNITS MATERIALS

A. Portland Cement: ASTM C 150, Type I or III. White and/or gray as required to match specified color.

B. Coarse Aggregates: ASTM C 33, except for gradation. Granite, quartz, or limestone.

C. Fine Aggregates: ASTM C 33, except for gradation. Manufactured or natural sands.

D. Pigments: ASTM C 979, except do not use carbon black pigments. Inorganic iron oxide pigments.

E. Water Reducing, Retarding, and Accelerating Admixtures: ASTM C 494.

F. Other admixtures: integral water repellents and other chemicals, for which no ASTM Standard exists, shall be previously established as suitable for use in concrete by proven field performance or through laboratory testing.

G. Water: Potable.

2.04 TEXTURE AND COLOR

A. General: Match texture and color of full-size sample on file with Architect.

B. Texture of Surfaces Exposed to View:
1. Fine-grained texture similar to natural stone and cast stone.
2. Approximately equal to approved sample when viewed in direct daylight at 10 feet.

C. Surface Air Voids:
1. Size: Maximum 1/32 inch.
2. Density: Less than 3 occurrences per any 1 square inch.
3. Viewing Conditions: Not obvious under direct daylight at 10 feet.

D. Finish:
1. Minor chipping resulting from shipping and delivery shall not be grounds for rejection of units.
2. Minor chips shall not be obvious under direct daylight at 20 feet, as determined by Architect.

3. The occurrence of crazing or efflorescence shall not constitute a cause for rejection.

E. Color Variation:
1. Viewing Conditions: Compare in direct daylight at 10 feet, between units of similar age, subjected to similar weathering conditions.

2.05 MORTAR

A. Mortar: ASTM C 270, Type N.

B. Mortar Materials: [As specified in Section 04 2000]

2.06 ACCESSORIES

A. Anchors: Non-corrosive type, sized for conditions. Type 304.

B. Sealant: As specified in Section 07 9200.

C. Cleaner: Prosoco Sure Klean Custom Masonry Cleaner, Prosoco Sure Klean 600 Detergent, or Prosoco Sure Klean Vana Trol.

2.07 FABRICATION

A. Shapes: As indicated on drawings.

2.08 TOLERANCES

A. General: Manufacture cast stone concrete masonry veneer units within tolerances in accordance with ASTM C 90, unless otherwise specified.

B. Length, height, width: Do not deviate by more than plus or minus 1/8 inch from approved dimensions. These requirements do not apply to split faced units.

2.09 PRODUCTION QUALITY CONTROL

A. Mix Designs: Test new and existing mix designs for applicable compressive strength and absorption compliance before manufacturing cast stone concrete masonry veneer units.

B. Plant Production Testing: Tests to be conducted by certified laboratory testing technicians. Test from specimens selected at random from plant production in accordance with ASTM C 140.

PART 3 EXECUTION

3.01 EXAMINATION

A. Examine construction to receive cast stone concrete masonry veneer units. Notify Architect if construction is not acceptable. Do not begin installation until unacceptable conditions have been corrected.

B. Examine cast stone concrete masonry veneer units before installation. Do not install unacceptable units.
   1. Waste: For various reasons due to shipping, handling or the manufacturing process, a small amount of RockCast Architectural Masonry Veneer units may have blemishes or chips and should be used for field cutting for maximum material utilization. When ordering material, please allow for waste (approximately 2 to 3%) and saw cutting in your estimate.
   2. All RockCast products are shipped on a pallet and have one unfinished side. Textured units are to be set with the texture face forward and smooth units are stacked "face up" on the pallet.
   3. RockCast Architectural Masonry Veneer units have an unfinished back, one finished face, and approximately 40 to 60% of the units have one smooth finished end. Architectural machine made split and chiseled faced units can be ordered with a matching finished end upon request.

3.02 INSTALLATION

A. Install units in conjunction with masonry, as specified in Section 04 2000.

B. Pull units from multiple cubes during installation to minimize variation in color and help with natural blending.

C. Cut units using motor-driven masonry saws. Finished ends should be turned to the visible side and the saw cut turned to the inside of the mortar joint to hide exposed aggregates and saw marks.

D. Do not use pry bars or other equipment in a manner that could damage units.

E. Fill dowel holes and anchor slots completely with mortar or non-shrink grout.

F. Use Type N mortar (ASTM C 270), unless specified otherwise.

G. Per ACI 530.1, it is not necessary, nor recommended, to wet the units prior to installation.

H. Set units in full bed of mortar, unless otherwise indicated on the drawings.

I. Fill vertical joints with mortar.

J. Make joints 3/8 inch, unless otherwise indicated on the drawings.

K. Tuck point mortar joints to slight concave profile (unless specified otherwise).

L. Remove excess mortar immediately.

M. Remove mortar fins and smears before tooling joints.

N. Cover wainscot for protection and bond separation with plastic, felt paper or other approved products.

O. Cover freshly installed masonry products as required to assist with the curing process.

P. Sealant Joints:
1. As specified in Section 07 9200.
2. Prime ends of units, insert properly sized backing rod, and install sealant.
3. Provide sealant joints at following locations:
   a. Joints at relieving angles.
   b. Control and expansion joints.
   c. As indicated on the drawings.

3.03 TOLERANCES

A. Installation Tolerances:
1. Variation from Plumb: Do not exceed 1/16 inch.
2. Variation from Level: Do not exceed 1/16 inch.
3. Variation in Joint Width: Do not vary joint thickness more than 1/8 inch or 1/4 of nominal joint width, whichever is greater.
4. Variation in Plane Between Adjacent Surfaces: Do not exceed 1/8-inch difference between planes of adjacent units or adjacent surfaces indicated to be flush with units.

3.04 CLEANING

A. Clean exposed units after mortar is thoroughly set and cured.

B. Perform test of cleaner on small area on each type and color and receive approval by Architect before full cleaning. Let test area dry 4 to 5 days before inspection. Keep test area for future comparison.

C. Clean units by wetting down the surface first, before using the specified cleaner (as specified in Section 2.7.C). Brush on cleaner, let dwell for 2 to 3 minutes. Reapply cleaner, scrub surface with masonry brush and rinse off thoroughly. Areas with heavy soiling use a wood block or non-metallic scraper.

D. Apply cleaner to units in accordance with cleaner manufacturer's instructions.

E. Do not use the following to clean units:
1. Muriatic acid.
2. Power washing.
3. Sandblasting.

4. Harsh cleaning materials or methods that would damage or discolor surfaces.

3.05 REPAIR

A. Repair chips and other surface damage noticeable when viewed in direct daylight at 20 feet.

B. Repair with touchup materials provided by manufacturer in accordance with manufacturer's instructions.

C. Repair methods and results to be approved by Architect.

3.06 INSPECTION AND ACCEPTANCE

A. Inspect completed installation in accordance with ACI 530 requirements.

3.07 PROTECTION

A. Protect installed units from splashing, stains, mortar, and other damage.

END OF SECTION

PART 1 - GENERAL

1.01 SCOPE OF WORK

A. Furnishing of and paying for all labor, materials, services, appliances and equipment necessary for the execution, installation and completion of all work specified herein and shown on the drawings.

B. Work included: All metal fabrication items listed, but not necessarily limited to the following:

1. Steel galvanized pipe bollards with concrete fill.
2. Hot-dipped galvanized miscellaneous steel lintel angles and plates which support brick veneer and/or other exposed veneer surfaces.
3. Miscellaneous steel channels, angles, tubing, pipes, clips, plates, and/or other miscellaneous steel members shown on drawings. All exterior steel members to be galvanized.
4. Shop Painting and Field Touch-up Painting.

1.02 REFERENCES

A. American Institute of Steel Construction, AISC Code, Section 10 - Architecturally Exposed Structural Steel.

B. American Society of Testing and Materials (ASTM):
1. A36 - Specification for Structural Steel (including bar grating tubing, plates, bars, etc.)
2. A53 - Pipe, Steel, Black and Hot-Dipped Zinc-Coated Welded and Seamless
3. A307 - Carbon Steel Bolts and Studs, 60,000 psi Tensile Strength
4. A325 - Specification for High Strength Bolts for Structural Steel
5. A490 - Heat - Treated Steel Structural Bolts, 50 ksi Minimum Tensile Strength
6. A563 - Carbon and Alloy Steel Nuts
7. E-119 - Fire Barriers at Expansion Joints, vertical barriers.
8. E-1399 - Standard Test Method for Cyclic Movement and Measuring the Minimum and Maximum Joint Widths of Architectural Joint Systems.

C. American Welding Society (AWS)
1. A2.0 - Standard Welding Symbols
2. D1.1 - Structural Welding Code

D. Steel Structures Painting Council (SSPC); Steel Structures Painting Manual, Vol. 1, "Good Painting Practice”, latest edition; and Vol. 2, Systems and Specs., latest edition.

E. Aluminum Extrusions; 6063-T5, clear anodized.

1.03 SUBMITTALS

A. Submit under provisions of Section 01 3000.

B. Shop Drawings:
1. Indicate profiles, sizes, connection attachments, anchorage, size and type of fasteners and accessories. Include erection drawings, elevations, and details where applicable.
2. Indicate welded connections with AWS A2.0 welding symbols. Indicate net weld lengths.

C. Manufacturer's Installation: Provide setting drawings, templates and directions for the installation of such devices.

D. Welders Certificates: Submit as per Article 1.04.

1.04 QUALIFICATIONS

A. Welders' Certificates: Submit under provisions of Section 01 3000, certifying welders employed on the work, verifying AWS qualification within the previous 12 months.

1.05 DELIVERY, STORAGE AND HANDLING

A. Delivery, store, protect and handle products to site under provisions of Section 01 6000.

B. Delivery of materials to be installed under other sections:
1. Anchor bolts, embeds, inserts, sleeves, stair attachments steel security bar grating frames and other anchorage devices which are embedded in cast-in-place concrete or masonry construction shall be delivered to the project site in time to be installed before the start of concrete operations or masonry work.

C. Storage of materials:
1. Steel members which are stored at the project site shall be above ground on platforms, skids or other supports.
2. Steel shall be protected from corrosion.
3. Other materials shall be stored in a weathertight and dry place until ready for use in the work.
4. Packaged materials shall be stored in their original unbroken package or container.

1.06 FIELD MEASUREMENTS

A. Verify exact field measurements.

PART 2 - PRODUCTS

2.01 MATERIALS

A. Structural steel shapes shall meet ASTM A 36. All surfaces of exterior members are to be galvanized.

B. Structural steel plates shall meet ASTM A 283, Grade C. All surfaces of exterior members are to be galvanized.

C. Steel bolts and fastenings shall meet ASTM A 307, Grade A. All surfaces of exterior members are to be galvanized.

D. Steel bars shall meet ASTM A 575. All surfaces of exterior members are to be galvanized.

E. Hollow structural tubing shall meet ASTM A 36, A 500 and A 501. All surfaces of exterior members are to be galvanized.

F. Steel pipe shall meet ASTM A 120 for standard weight (Schedule 40) pipe and ASTM A 53, Type E, Grade E. All surfaces of exterior members are to be galvanized.

G. Aluminum extrusions shall meet ASTM B 211, temper best suited for purpose.

H. Aluminum plates and sheets shall meet ASTM B209, temper best suited for purpose.

I. Fastenings shall be stainless steel for exterior. Match adjacent material for interior. Stainless steel shall meet AISI 300 series. Exposed screws shall be Phillips flat head, countersunk. Use bolts for field connections only. Provide washers under heads and nuts. Draw all nuts tight and nick threads of permanent connections. Use beveled washers where bearing is on sloped surfaces. Where screws must be used for permanent connections in ferrous metal, use flat head type, countersunk, with screw slots filled and finished smooth and flush.

J. Rough Hardware: Provide bent or otherwise custom fabricated bolts, plates, anchors, hangers, dowels and other miscellaneous steel and iron shapes as required for framing and supporting woodwork, and for anchoring or securing woodwork to concrete and other structures. Manufacture of fabricate items of sizes, shapes and dimensions required. Provide malleable iron washers for heads and nuts which bear on wood structural connections; elsewhere furnish steel washers.

K. Loose Bearing and Leveling Plates: Provide loose bearing and leveling plates for steel items bearing on concrete construction, made flat, free from warps or twists, and of required thickness and bearing area. Drill plates to receive anchor bolts and for grouting as required. Galvanize after fabrication.

L. Miscellaneous Framing and Supports: Provide miscellaneous framing and supports which are not part of structural steel framework, as required to complete the Work. Fabricate miscellaneous units to sizes, shapes and profiles shown; or, if not shown, of required dimensions to receive adjacent other work to be retained by framing. Fabricate the miscellaneous units from structural steel shapes, plates and steel bars of welded construction with mitered joints for field connection, unless otherwise shown. Cut, drill and tap units to receive hardware. Equip units with integrally welded anchors for casting into concrete or building into masonry, and furnish inserts if units must be installed after concrete is placed. Galvanize miscellaneous frames and supports where indicated, including all exterior steel members. All steel lintel angles and plates supporting Brick Veneer shall be hot-dipped galvanized 1.2 mil thickness.

M. Pipe Sleeves: All metal posts and pipes set in concrete shall be inserted into galvanized pipe sleeves. Sleeves shall be length as required by 1-1/2 inches larger than the post or pipe they are to receive and the same shape (round, square or rectangular). Fabricate sleeves from 18 gauge galvanized steel. Provide two hairpin anchors per sleeve. All joints and connections shall be full welded, and the entire sleeve assembly shall be hot-dipped galvanized after fabrication.

N. Pipe Bollards: Fabricate bollards with a 6 inch diameter standard galvanized steel pipe. Post length shall be as detailed to project 4’ – 0” above grade or as shown. After fabrication bollards shall be chemically treated for paint adhesion and be given a shop coat of primer. Portion of bollard set in concrete below grade shall be coated with asphaltic paint. Fill with concrete and form crown on top to permit water run-off.

O. Primer used to touch up galvanized surfaces shall be manufacturer's standard or similar to ZRC Chemical Products Company of Quincy, Massachusetts, ZRC Cold Galvanizing Compound.

PART 3 - EXECUTION

3.01 WORKMANSHIP

A. Metal work shall be well formed to shape and size with sharp lines, angles, and arises. Shearing and punching shall leave clean, true lines and surfaces. Thickness of metal, details of metal, details of assembly and support shall give ample strength and stiffness for the intended purpose.

B. Conceal fastenings where practicable. Form joints exposed to weather to exclude water. For permanent connections use welds where possible. Welds exposed to view shall be ground and dressed smooth. Provide lugs, clips, anchors and miscellaneous fastenings necessary for complete assembly and installation. Miter corners and angles of exposed moldings and frames.

C. Grout frames, plates, sills, bolts and similar items with non-shrink grout as specified in Section 03300. Set railings and similar items shown or required to set in sleeves or cans with molten lead or quick setting anchor cement.

D. Make trim in longest lengths possible, locate joints symmetrically. Fit adjacent pieces with hairline joints and aligned surfaces. Space exposed screws evenly and symmetrically.

3.02 PREPARATION FOR MISCELLANEOUS ITEMS

A. Furnish setting drawings, diagrams, templates, instructions and directions for installation of anchorages, such as concrete inserts, anchor bolts and miscellaneous items having integral anchors, which are to be embedded in concrete construction. Coordinate delivery of such items to project site.

3.03 SETTING LOOSE PLATES

A. Clean concrete bearing surfaces to any bond-reducing material and roughen to improve bond to surfaces. Clean the bottom surface of bearing plates. Set loose leveling and bearing plates on wedges or other adjustable devices. After the bearing members have been positioned and plumbed, tighten the anchor bolts. Do not remove wedges or shims; but if protruding, cut off flush with the edge of the bearing plate before packing with grout. Pack grout solidly between bearing surfaces and plates to ensure that no voids remain.

3.04 FASTENING TO IN-PLACE CONSTRUCTION

A. Provide anchorage devices and fasteners where necessary for securing miscellaneous metal fabrications to in-place construction including threaded fasteners for concrete inserts, toggle bolts, through-bolts, lag bolts, wood screws and other connectors as required.

3.05 CUTTING, FITTING AND PLACEMENT

A. Perform cutting, drilling and fitting required for installation of miscellaneous metal fabrications. Set work accurately in location, alignment and elevation, and make plumb, level, true and free from rack, measured from established lines and levels. Provide temporary bracing or anchors in formwork for items which are to be built into concrete or similar construction. Fit exposed connections accurately together to form tight hairline joints Weld connections which are not to be left as exposed joints, but cannot be shop welded because of shipping size limitations. Grind exposed joints smooth and touch up shop paint coat. Do not weld, cut or abrade the surfaces of exterior units which have been hot-dip galvanized after fabrication and are intended for bolted or screwed field connections.

3.06 FIELD WELDING

A. Comply with AWS code for procedures of manual shielded metal-arc welding, appearance and quality of weld made, and methods in correcting welding work.

3.07 PIPE BOLLARDS

A. Shall be set with 4’ – 0” projecting above grade or as shown on the Drawings. Set posts in round concrete filled postholes as shown on drawings.

3.08 SLEEVES

A. Shall be installed proper location prior to the placing of concrete. Set sleeves at proper elevations, spread hairpin anchors and tie into place. Sleeves are not to be elevated with any material foreign to that used in normal concrete placement. Prior to concrete placement pack all sleeves with paper or cloth wadding. Final installation shall leave sleeves flush with top of the concrete and in true vertical position. Wadding is to remain in the sleeves until posts are set.

3.09 PAINTING AND PROTECTIVE COATING

A. All ferrous metal, except stainless steel and galvanized surfaces, shall be properly cleaned and given one shop coat of Zinc Rich primer. Anchors that are built into masonry shall be coated with asphalt paint unless specified to be galvanized. Metal work to be encased in concrete shall be left unpainted unless specified or noted otherwise. Where hot-dip galvanized or zinc-coated metal is specified or shown, it shall not be shop-primed unless specifically required.

B. Hot-dip galvanizing or zinc coatings applied on products fabricated from rolled, pressed, and forged steel shapes, plates , bars and strips shall comply with ASTM Specification A 123. Hot-dip galvanizing or zinc coatings on assembled steel products shall comply with ASTM Specification A 386. Galvanized surfaces for which a coat of paint is specified shall be chemically treated to provide a bond for the paint. Except for bolts and nuts, all galvanizing shall be done after fabrication.

3.10 TOLERANCES FOR EXPOSED WORK

A. Machine filed and shop assembled mechanical joints shall fit within 1/32". Install free-standing items to 1/4" of correct position. Items enclosed or recessed in finished surfaces shall be centered in openings unless detailed otherwise. Sizes of each element of an assembly shall be correct within 1/8". Total size of an enclosed assembly shall be correct within 1/4" clear of opening and not more than 1/8" all around. Total size of a free-standing assembly shall be correct within 1/2". No part of the hole shall show around screws or bolts, and no extra or unused holes shall show on faces of item.

3.11 PROTECTION AND TOUCH-UP PAINTING

A. Protect miscellaneous metal items from damage until building is turned over to Owner. Immediately after erection, clean field welds, bolted connections and abraded areas of shop paint, and paint exposed areas with same material and thickness used for shop painting. Remove all rust before repriming. Where touch-up is required, sand or steel wool primer coat to feather edge and brush out touch-up to provide a smooth finish surface ready for job painting.

3.12 CLEANING

A. Before final inspection, remove all protective maskings and coverings and clean exposed surfaces of foreign matter. Clean to remove dirt, stains, soil marks and other matter. Aluminum shall be cleaned with plain water containing a mild soap or detergent, or white gasoline, kerosene or distillate. No abrasive agent shall be used on aluminum. At the completion of this work, remove from the site all excess materials and debris. Leave entire work area in a neat and workmanlike condition ready for final inspection.

END OF SECTION

PART 1 - GENERAL

1.01 SECTION INCLUDES

A. Expansion joint assemblies for roof, wall and ceiling surfaces.

B. Compressible fillers (interior and exterior).

1.02 REFERENCES

A. ANSI/ASTM B221 Aluminum-Alloy, Extruded Bar, Rod, Wire, Shape and tube.

B. ANSI/ASTM B308 Aluminum-Alloy, Standard Structural Shapes, Rolled or Extruded.

C. ANSI/ASTM B445 – Copper-Zinc-Lead Alloy (Leaded-Brass) Extruded Shapes.

1.03 QUALITY ASSURANCE

A. Materials and work shall conform to the latest edition of reference specifications specified herein and to all applicable codes and requirements of local authorities having jurisdiction.

B. Fire Resistance: Where fire resistant construction is indicated on the drawings, provide expansion joint cover assemblies identical to those of assemblies whose fire resistance and cycling capability has been determined per UL 2079 by Underwriter Laboratories, Inc. Fire rating shall be not less than the rating of adjacent construction.

1.04 SUBMITTALS

A. Submit under provision of Division 1.

B. Product Data: Provide joint assembly profiles, dimensions, locations in the Work, affected adjacent construction, anchorage devices, available colors and finish, locations of splices and joinery with other types.

C. Submit samples, illustrating profile, dimension, color and finish- selected.

1.05 FIELD MEASUREMENTS

A. Verify that field measurements are as instructed by the manufacturer.

1.06 DELIVERY, STORAGE & HANDLING

A. Exercise proper care in the handling of all work so as not to injure the finished surface, and take proper precautions to protect the work from damage after it is in place.

B. Store materials under cover in a dry and clean location off the ground. Remove materials that are damaged or otherwise not suitable for installation from the job site and replace with acceptable materials at no additional cost.

PART 2 - PRODUCTS

2.01 ACCEPTABLE MANUFACTURERS

A. C/S Group – Product numbers listed below are C/S Group numbers.

B. Substitutions: Under provisions of Division 1.

2.02 MATERIALS

A. Exterior Wall / Soffit Expansion Joint Cover: SF 200

B. Roof Expansion Joint Cover BRJ 200 or 300 (use BRJW 200 at corner locations).

PART 3 - EXECUTION

3.01 EXAMINATION

A. Verify that joint preparation and affected dimensions are acceptable.

3.02 PREPARATION

A. Provide anchoring devices for installation and embedment.

B. Provide templates and rough-in measurements.

C. Verify that all required firestopping materials are in place.

3.03 INSTALLATION

A. Install components and accessories in accordance with manufacturer's instructions.

B. Align work plumb and level, flush with adjacent surfaces.

C. Rigidly anchor components to substrate to prevent misalignment.

3.04 PROTECTION OF FINISHED WORK

A. Protect finished work under provisions of Division 1.

B. Do not permit traffic over unprotected floor joint surfaces.

C. Provide removable strippable coating to protect finish surface.

END OF SECTION

PART 1 - GENERAL

1.01 Requirements: Applicable provisions of Division 0 and Division 1 govern all work specified in this Section.

1.02 Section Includes:

A. Non-structural dimension lumber framing.

B. Preservative treated wood materials.

C Fire retardant treated wood materials.

D. Miscellaneous framing and sheathing.

E. Communications and electrical room mounting boards.

F. Concealed wood blocking, nailers, and supports.

G. Miscellaneous wood nailers, furring, and grounds.

1.03 Reference Standards:

A. ANSI A208.1 - American National Standard for Particleboard; 2009.

B. ASTM A153/A153M - Standard Specification for Zinc Coating (Hot-Dip) on Iron and Steel Hardware; 2009.

C. ASTM A653/A653M - Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process; 2015.

D. ASTM D2898 - Standard Test Methods for Accelerated Weathering of Fire-Retardant-Treated Wood for Fire Testing; 2010.

E. ASTM D3273 - Standard Test Method for Resistance to Growth of Mold on the Surface of Interior Coatings in an Environmental Chamber; 2012.

F. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials; 2015a.

G. ASTM E96/E96M - Standard Test Methods for Water Vapor Transmission of Materials; 2014.

H. AWPA U1 - Use Category System: User Specification for Treated Wood; 2012.

I. ICC-ES AC38 - Acceptance Criteria for Water-Resistive Barriers; ICC Evaluation Service, Inc; 2013.

J. PS 1 - Structural Plywood; 2009.

K. PS 20 - American Softwood Lumber Standard; 2010.

L. SPIB (GR) - Grading Rules; 2014.

PART 2 - PRODUCTS

2.01 Material:

A. Lumber Blocking: Southern Pine fire retardant, Utility Grade or better. The sizes of the lumber blocking shall be as indicated on the Drawings.

B. Interior Plywood: American Plywood Association, C-D Plugged Interior fire retardant. The thickness of the plywood shall be as indicated on the Drawings.

C. Exterior Plywood: American Plywood Association, C-D Plugged fire retardant with exterior glue. The thickness of the plywood shall be as indicated on the Drawings.

2.02 Wood Treatment:

A. Against Decay: Chromated copper arsenate solution or pentachlorophenol impregnated into the lumber or plywood by vacuum pressure in accordance with FS-TT-W-571 and recommended practices of American Wood Preservers Association.

B. Against Flammability: In accordance with ASTM D2898-81 and shall have a flame spread of 25 or less when tested in accordance with ASTM E84-84, Test Method for Surface Burning Characteristics of Building Materials. All fire retardant treated lumber and plywood shall bear a performance identification or certification label of Underwriters Laboratories or Nationwide Consumer Testing Institute as required by national or regional standards for fire retardant treated lumber.

C. Moisture Content:

1. Lumber: Kiln dried to 19% maximum.
2. Plywood: Kiln dried to 15% maximum.

2.03 Furnish all rough hardware, such as specified in Section 05 5000 - Metal Fabrication, and as shown on the Drawings and as may be required for completed installations.

PART 3 - EXECUTION

3.01 Continuous wood plates at sills, copings and in the area of the roof must be installed straight and level. Grout or otherwise shim to obtain required levels. Use lumber in lengths as long as practicable and bolt to substrate at 3'-6" O.C. maximum.

3.02 Wood employed to form curbs at roof expansion joints must be properly secured to the substrate in a straight line at the proper elevations above the roof insulation and bolted to the substrate at 2'-0" O.C. maximum.

3.03 All framing, blocking, grounds, screeds, etc., shall be cleanly cut and securely fastened by appropriate means and according to industry standards.

3.04 Install fire retardant wood blocking or plywood reinforcing in or upon all drywall partitions that will receive counter tops, cabinets, or other miscellaneous items supported from partitions such as toilet accessories, mirrors, etc., or as indicated on the Drawings.

END OF SECTION

PART 1 - GENERAL

1.01 SECTION INCLUDES

A. Countertops for architectural cabinetwork.

1.02 REFERENCE STANDARDS

A. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials; 2010b.

B. ISSFA-2 - Classification and Standards for Solid Surfacing Material; International Solid Surface Fabricators Association; 2001 (2007).

C. PS 1 - Structural Plywood; 2007.

1.03 SUBMITTALS

A. See Section 01300 - Administrative Requirements, for submittal procedures.

B. Product Data: Manufacturer's data sheets on each product to be used, including:
   1. Preparation instructions and recommendations.
   2. Storage and handling requirements and recommendations.
   3. Specimen warranty.

C. Shop Drawings: Complete details of materials and installation; combine with shop drawings of cabinets and casework specified in other sections. Show locations and sizes of cutouts and holes for plumbing fixtures, faucets, soap dispensers, waste receptacles, and other items installed in solid surface.

D. Verification Samples: For each finish product specified, minimum size 6 inches square, representing actual product, color, and patterns.

E. Test Reports: Chemical resistance testing, showing compliance with specified requirements.

F. Installation Instructions: Manufacturer's installation instructions and recommendations.

G. Maintenance Data: Manufacturer's instructions and recommendations for maintenance and repair of countertop surfaces.

1.04 QUALITY ASSURANCE

A. Fabricator Qualifications: Same fabricator as for cabinets on which tops are to be installed.

B. Installer Qualifications: Fabricator.

1.05 DELIVERY, STORAGE, AND HANDLING

A. Do not deliver components to project site until areas are ready for installation.

B. Store products in manufacturer's unopened packaging until ready for installation.

C. Store and dispose of solvent-based materials, and materials used with solvent-based materials, in accordance with requirements of local authorities having jurisdiction.

1.06 FIELD CONDITIONS

A. Maintain environmental conditions (temperature, humidity, and ventilation) within limits recommended by manufacturer for optimum results. Do not install products under environmental conditions outside manufacturer's absolute limits.

1.07 WARRANTY

A. Provide manufacturer's 10 year warranty against defects in solid surface materials.
   1. Warranty shall provide material to repair or replace defective materials.

PART 2 - PRODUCTS

2.01 SOLID POLYMER FABRICATIONS

A. Acceptable products: Solid Surfacing from Formica Corp. or approved equivalent.

B. Material: Cast, filled acrylic; not coated, laminated or of composite construction, meeting ANSI Z124-1980, Type Six and Fed. Spec. WW-P-541E/GEN dated August 1, 1980.
   1. Material shall have minimum physical and performance properties specified.
   2. Superficial damage to a depth of 0.10” (25 mm) shall be repairable by sanding or polishing.

C. Countertops: ¾” thick solid polymer adhesively joined with no exposed seams, having edge details as indicated on the Drawings.

D. Colors: As indicated on the drawings.

2.02 ACCESSORY MATERIALS

A. Wood-Based Components:
   1. Wood fabricated from old growth timber is not permitted.

B. Plywood for Supporting Substrate: PS 1 Exterior Grade, A-C veneer grade, minimum 5-ply; minimum 3/4 inch thick; join lengths using metal splines.

C. Adhesives: Chemical resistant waterproof adhesive as recommended by manufacturer of materials being joined.
   1. Provide color matched seams.

D. Sealant: Manufacturer's standard mildew-resistant, FDA-compliant silicone sealant in colors matching components.

2.03 FABRICATION

A. Fabricate tops and splashes in the largest sections practicable, with top surface of joints flush.
   1. Join lengths of tops using best method recommended by manufacturer.
   2. Fabricate to overhang fronts and ends of cabinets 1 inch except where top butts against cabinet or wall.
   3. Prepare all cutouts accurately to size; replace tops having improperly dimensioned or unnecessary cutouts or fixture holes.

B. Rout and finish component edges with clean, sharp returns.
   1. Rout cutout, radii and contours to template.
   2. Smooth edges.

C. Provide back/end splash wherever counter edge abuts vertical surface unless otherwise indicated.
   1. Secure to countertop with concealed fasteners and with contact surfaces set in waterproof glue.
   2. Height: 4 inches, unless otherwise indicated.

D. Fabricate tops up to 144 inches long in one piece; join pieces with adhesive sealant in accordance with manufacturer's recommendations and instructions.

E. Wall-Mounted Counters: Provide skirts, aprons, brackets, and braces as indicated on drawings.

PART 3 - EXECUTION

3.01 EXAMINATION

A. Do not begin installation until substrates have been properly prepared.

B. If substrate preparation is the responsibility of another installer, notify Architect of unsatisfactory preparation before proceeding.

C. Verify that wall surfaces have been finished and mechanical and electrical services and outlets are installed in proper locations.

3.02 PREPARATION

A. Clean surfaces thoroughly prior to installation.

B. Prepare surfaces using the methods recommended by the manufacturer for achieving the best result for the substrate under the project conditions.

3.03 INSTALLATION

A. Install components plumb and level, in accordance approved shop drawings and project installation details.
   1. Provide products in largest pieces available.

B. Securely attach countertops to cabinets using manufacturer's recommended adhesive.

C. Provide backsplashes and endsplashes as indicated on drawings.
   1. Adhere to countertops using manufacturer's color-matched silicone sealant.
   2. Form field joints using manufacturer's recommended adhesive, with joints inconspicuous in finished work.
   3. Exposed joint/seams shall not be allowed.
   4. Align adjacent countertops and form seams to comply with manufacturer's written recommendations using adhesive in color to match countertop.

D. Install applied backsplashes and sidesplashes using manufacturer's standard color-matched silicone sealant. Adhere applied backsplashes and sidesplashes to countertops using manufacturer's standard color-matched silicone sealant.

E. Seal joint between back/end splashes and vertical surfaces.

F. Sinks: Secure sinks to tops using manufacturer's recommended sealant and adhesive. See plumbing drawings.

3.04 TOLERANCES

A. Variation From Horizontal: 1/8 inch in 10 feet, maximum.

B. Offset From Wall, Countertops: 1/8 inch maximum; 1/16 inch minimum.

C. Field Joints: 1/8 inch wide, maximum.

3.05 CLEANING

A. Clean countertops surfaces thoroughly.

B. Remove adhesives, sealants and other stains.

3.06 PROTECTION

A. Protect installed products until completion of project.

B. Touch-up, repair or replace damaged products before Substantial Completion.

END OF SECTION

PART 1 GENERAL

1.01 SCOPE OF WORK

A. Furnishing of and paying for all labor, materials, services, equipment and appliances necessary for the execution, installation and completion of all work specified herein and as shown on drawings.

B. Section includes:
   1. Sheet and sealant materials to provide a continuous vapor and air barrier over plywood sheathing.

1.02 REFERENCES

A. American Society of Testing and Materials (ASTM):
   1. D882 - Test Methods for Tensile Properties of Thin Plastic
   2. E96 - Test Methods for Water Vapor Transmission of Materials

1.03 PERFORMANCE REQUIREMENTS

A. Materials of this Section shall provide continuity of building enclosure vapor and air barrier:
   1. To seal gaps between building enclosure components and wall and roof opening frames.

1.04 SUBMITTALS

A. Submit under provisions of Section 01 3000.

B. Product Data: Provide data indicating material characteristics, performance criteria and limitations.

1.05 PROJECT RECORD DOCUMENTS

A. Submit under provision of Section 01 7200.

B. Submittals

1.06 ENVIRONMENTAL REQUIREMENTS

A. Do not install solvent curing sealants in enclosed building spaces without ventilation.

B. Maintain temperature and humidity recommended by the materials manufacturers before, during, and after installation.

PART 2 PRODUCTS

2.01 SHEET MATERIAL

A. Manufacturer:
   1. Tyvek Housewrap as manufactured by duPont Company, Wilmington, Delaware
   2. Substitution: Under provisions of Section 01 6000.

B. Material:

1. 100 percent spun bonded olefin. Manufactured from polyethylene fibers which have been bonded by heat and pressure without binders or fillers into a tough durable sheet structure and coated with a U.V. light inhibitor.

C. Properties:
   1. Moisture Vapor Transmission Rate:
      a. ASTM E96 (Procedure B) 26 g/100 in 2/day (400 g/m^2 day (average)
   2. Air Porosity, seconds:
      a. TAPPI T-460 90 sec/100cc (minimum)
   3. Water Resistance:
      a. AATCC 127 minimum 45 inches (114 cm) (minimum)
   4. Tensile MD:
      a. ASTM D882 minimum 20 lbs/in. (minimum)
   5. Tensile CD:
      a. ASTM D882 minimum 23.5 lbs/in. (minimum)

D. Fire hazard classification for flame/smoke - 0/40

2.02 SEALANT

A. As specified in Section 07 9200.

2.03 ADHESIVES

A. Adhesive: Compatible with sheet barrier and substrate, permanently non-curing as recommended by Sheet Material manufacturer.

2.04 ACCESSORIES

A. Tape: Polyethylene self-adhering type, 2 inches wide, compatible with sheet material.

B. Attachments: Galvanized steel bars and anchors.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify that surfaces and conditions are ready to accept the work.

3.02 PREPARATION

A. Remove loose or foreign matter which might impair vapor/air barrier.

3.03 INSTALLATION

A. Install sheet materials in accordance with manufacturer's instructions.

B. Install sealant and tape in accordance with manufacturer's instructions.

C. Vapor/air barrier to be applied directly over the exterior sheathing and attached at the top center and bottom of every second stud in the following sequence.
   1. At ground level, begin at any corner and unroll vapor/air barrier from left to right. Place the roll one foot around the corner and staple the edge, covering the wall surface.

2. Staple from top to bottom, smoothing wrinkles toward the soleplate. To minimize wrinkles, keep vapor/air barrier taut against sheathing. The staples should be placed about 30 inches apart.
3. Install vapor/air barrier around the structure, covering door openings, windows, soleplate, and sills. Overlap the soleplate by six inches.
4. When more than one roll of vapor/air barrier is required, start the new roll with an 8-inch overlap. When completing the wrap-around, finish with an 8 inch overlap and adhere.
5. After the structure is completely wrapped, an "X" cut is made from corner to corner at all windows, doors, etc. Vapor/air barrier is pulled in over the frame and attached inside.

D. Seal all penetrations and repair all damaged vapor/air barrier with tape.

3.04 PROTECTION OF FINISHED WORK

A. Protect finished work under provisions of Section 01 5000.

B. Do not permit adjacent work to damage work of this section.

END OF SECTION

PART 1 - GENERAL

1.01 SYSTEM DESCRIPTION

A. System performance to provide continuity of thermal barrier at building enclosure elements

1.02 SUBMITTALS

A. Product Data: Submit data on insulation materials.

B. Installation Instructions: Submit manufacturers printed instructions.

1.03 ENVIRONMENTAL REQUIREMENTS

A. Installation insulation adhesive in accordance with manufacturer's instructions.

PART 2 - PRODUCTS

2.01 BUILDING INSULATION

A. Manufacturer/Product:

1. Dow Chemical Co.; Styrofoam Cavitymate.

B. Thermal Batt Insulation: ASTM C665, Type III (foil faced); Class B; performed glass fiber roll; manufactured by Owens Corning, conformed to the following:

Thermal Resistance	R-Value as scheduled
Roll Size	16 or 24 inches wide as indicated
Facing	Foil Faced on one side

PART 3 - EXECUTION

3.01 EXAMINATION/PREPARATION

A. Styrofoam Board Insulation: Verify that concrete unit masonry dampproofing has been installed and is compatible with the insulation board.

3.02 INSTALLATION – INSULATION BOARD

A. Install in accordance with manufacturer's printed instructions.

3.03 SCHEDULES

A. Provide insulation as scheduled or as indicated on Drawings.

END OF SECTION

PART 1 - GENERAL

1.01 SUMMARY

A. Products Supplied Under This Section
   1. Vapor Barrier, seam tape, mastic, pipe boots, detail strip and all required accessories for installation under concrete slabs.

1.02 REFERENCES

A. American Society for Testing and Materials (ASTM)
   1. ASTM E 1745-09 Standard Specification for Plastic Water Vapor Retarders Used in Contact with Soil or Granular Fill Under Concrete Slabs.
   2. ASTM E 154-99 (2005) Standrad Test Methods for Water Vapor Retarders Used in Contact with Earth Under Concrete Slabs.
   3. ASTM E 96-05 Standard Test Methods for Water Vapor Transmisison of Materials.
   4. ASTM E 1643-09 Standard Practice for Installation of Water Vapor Retarders Used in Contract with Earth or Granular Fill Under Concrete Slabs.

B. American Concrete Institute (ACI)
   1. ACI 302.2R-06 Vapor Barrier Component (plastic membrane) is not less than 15 mils thick.

1.03 SUBMITTALS

A. Quality Control / Assurance
   1. Independent laboratory test results showing compliance with ASTM & ACI Standards.
   2. Manufacturer's samples, literature
   3. Manufacturer's installation instructions for placement, seaming and pipe boot installation.

PART 2 - PRODUCTS

2.01 MATERIALS

A. Vapor Barrier
   1. Vapor Barrier must have the following qualities:
      a. Permeance of less than 0.01 Perms as tested in accordance with ASTM E 1745, Section 7.
      b. ASTM E 1745 Class A (Plastics)
      c. Thickness: 15 mils minimum.
   2. Vapor Barrier Products
      a. Stego Wrap (15 mil) Vapor Barrier by STEGO INDUSTRIES LLC, San Juan Capistrano, CA (877) 464-7834 www.stegoindustries.com or approved equivalent.

PART 3 - EXECUTION

3.01 PREPARATION

A. Ensure that subsoil is approved by geotechnical firm
   1. Level and tamp or roll aggregate, sand or taped earth base.

3.02 INSTALLATION

A. Install Vapor Barrier / Retarder:
   1. Installation shall be in accordance with manufacturer's instructions and ASTM E 1643.
      a. Unroll Vapor Barrier with the longest dimension parallel with the direction of the pour.

b. Lap Vapor Barrier over footings and seal to foundation walls.
c. Overlap joints 6 inches and seal with manufacturer's tape.
d. Seal all penetrations (including pipes) per manufactuer's instructions.
e. No penetration of the Vapor Barrier / Retarder is allowed except for reinforcing steel and permanent utilities.
f. Repair damaged areas by cutting patches of Vapor Barrier / Retarder, overlapping damaged area 6 inches and taping all four stides with tape.

END OF SECTION

PART 1 - GENERAL

1.1 SECTION INCLUDES

A. Fastening system.
B. Factory finishing.
C. Accessories and miscellaneous components.

1.2 RELATED REQUIREMENTS

A. Section 07 6500 - Sheet Metal Flashing And Trim
B. Section 07 9200- Joint Sealers: Field-installed sealants.

1.3 REFERENCE STANDARDS

A. ASCE 7 - Minimum Design Loads for Buildings and Other Structures; 2011.
B. ASTM A653/A653M - Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process; 010.
C. FM DS 1-28 - Wind Design; 2012 IBC.
D. SMACNA (ASMM) - Architectural Sheet Metal Manual; 2003.

1.4 SUBMITTALS

A. See Section 013000 - Administrative Requirements, for submittal procedures.

B. Product Data: Manufacturer's data sheets on each product to be used, including:
   1. Storage and handling requirements and recommendations.
   2. Installation methods.
   3. Specimen warranty.

C. Shop Drawings: Include layouts of wall panels, details of edge and penetration conditions, spacing and type of connections, flashings, underlayments, and special conditions.
   1. Show work to be field-fabricated or field-assembled.
   2. Include structural analysis signed and sealed by qualified structural engineer, indicating conformance of wall system to specified loading conditions.

D. Selection Samples: For wall system specified, submit color chips representing manufacturer's range of 5 closest available colors and patterns.

E. Verification Samples: For each wall system specified, submit samples of minimum size 12 inches square, representing actual wall metal, thickness, profile, color, and texture.
   1. Include typical panel joint in sample.
   2. Include typical fastening detail.

F. Test Reports: Indicate compliance of preformed metal wall system to specified requirements.

G. Warranty: Submit specified manufacturer's warranty and ensure that forms have been completed in Owner's name and are registered with manufacturer.

1.5 QUALITY ASSURANCE

A. Manufacturer/Source: Provide metal wall panel assembly and accessories from a single manufacturer providing fixed-base roll forming, and accredited under IAS AC 472 Part B.

B. Manufacturer Qualifications: Approved manufacturer listed in this Section with minimum five years experience in manufacture of similar products in successful use in similar applications.

1. Approval of Comparable Products: Submit the following in accordance with project substitution requirements, within time allowed for substitution review:

a. Request for substitution MUST be received by the Architect, not less than TEN (10) business days before bids are due. If approved, acceptable alternates will be included by Addenda.

b. Product data, including certified independent test data indicating compliance with requirements.
c. Samples of each component.
d. Sample submittal from similar project.
e. Project references: Minimum of five installations not less than five years old, with Owner and Architect contact information.
f. Sample warranty.
g. IAS AC 472 certificate.

2. Substitutions following award of contract are not allowed except as stipulated in Division 01 General Requirements.
3. Approved manufacturers must meet separate requirements of Submittals Article.

C. Installer Qualifications: Experienced Installer certified by metal panel manufacturer with minimum of five years experience with successfully completed projects of a similar nature and scope.

1. Installer's Field Supervisor: Experienced mechanic certified by metal panel manufacturer supervising work on site whenever work is underway.

1.6 DELIVERY, STORAGE, AND HANDLING

A. Store wall panels on project site as recommended by manufacturer to minimize damage to panels prior to installation.

1.7 WARRANTY

A The Contractor shall provide to the Owner, a Standard warranty signed by the wall manufacturer.

B. Special Panel Finish Warranty: On Manufacturer's standard form, in which Manufacturer agrees to repair or replace metal panels that evidence deterioration of factory-applied finish.

C. A Two (2) year warranty for materials and workmanship shall be provided by the wall panel installer.

PART 2 - PRODUCTS

2.1 SNAP-CLAD PANEL

D. Manufacturer: Carlisle Corporation, Tyler, Texas, 800-441-8661
1. Snap-Clad panels:
   a. Panel: Smooth
   b. Gauge: 24 ga.
   c. Width: Varies from 10" to 18"
   d. Finish: Standard Color
   e. Material: Steel

2.2 RIBBED PANEL

E. Manufacturer: Custom Components and Buildings, Janesville, WI, 608-758-2736
1. Ribbed panel:
   a. Panel: SP-2 profile
   b. Gauge: 22 ga./26 ga
   c. Finish: Standard paint finish
   d. Material: Steel
   e. Embossing: None

2.3 PERFORMANCE REQUIREMENTS

A. General: Provide metal wall panel system meeting performance requirements as determined by application of specified tests by a qualified testing facility on manufacturer's standard assemblies.

B. Recycled Content: For Steel Products: Postconsumer recycled content plus one-half of pre-consumer recycled content not less than 25 percent.

C. Radiative Property Performance:

D. Wind Uplift Resistance: Comply with UL 580 for wind-uplift class UL-90.

E. Thermal Movements: Allow for thermal movements from variations in both ambient and internal temperatures. Accommodate movement of support structure caused by thermal expansion and contraction. Allow for deflection and design for thermal stresses caused by temperature differences from one side of the panel to the other.

2.4 ATTACHMENT SYSTEM

A. General: Provide complete metal wall panel assembly incorporating trim and miscellaneous flashings, in profiles as indicated. Provide required fasteners, closure strips, thermal spacers, splice plates, support plates, and sealants as indicated in manufacturer's written instructions.

B. Flashing and Trim: Match material, thickness, and finish of metal panel face sheet.

C. Panel Fasteners: Self-tapping screws and other acceptable corrosion-resistant fasteners recommended by wall panel manufacturer. Where exposed fasteners cannot be avoided, supply fasteners with EPDM or neoprene gaskets, with heads matching color of metal panels by means of factory-applied coating.

D. Joint Sealers: Manufacturer's standard or recommended liquid and preformed sealers and tapes, and as follows:

1. Factory-Applied Seam Sealant: Manufacturer's standard hot-melt type.
2. Tape Sealers: Manufacturer's standard non-curing butyl tape, AAMA 809.2.

E. Steel Sheet Miscellaneous Framing Components: ASTM C 645, with ASTM A 653/A 653M, G60 (Z180) hot-dip galvanized zinc coating.

2.5 FABRICATION

A. General: Provide factory fabricated and finished metal panels and accessories meeting performance requirements, indicated profiles, and structural requirements.

B. Fabricate metal panel joints configured to accept factory-applied sealant providing weathertight seal and preventing metal-to-metal contact and minimizing noise resulting from thermal movement.

C. Form panels in continuous lengths for full length of detailed runs, except where otherwise indicated on approved shop drawings.

D. Sheet Metal Flashing and Trim: Fabricate flashing and trim to comply with manufacturer's written instructions, approved shop drawings, and project drawings. Form from materials matching metal panel substrate and finish.

2.6 ACCESSORIES AND MISCELLANEOUS ITEMS

A. Miscellaneous Sheet Metal Items: Provide flashings, trim, moldings, additional framing as needed, closure strips, and caps, of the same material, thickness, and finish as used for the wall panels. Items completely concealed after installation may optionally be made of stainless steel.

B. Sealants: As specified in Section 079200.
1. Exposed sealant must cure to rubber-like consistency.
2. Concealed sealant must be non-hardening type.
3. Seam sealant must be factory-applied, non-skinning, non-drying type.

2.7 FABRICATION

A. Panels: Fabricate panels and accessory items at factory, using

manufacturer's standard processes as required to achieve specified appearance and performance requirements.

B. Joints: Factory-install captive gaskets, sealants, or separator strips at panel joints to provide weathertight seals, eliminate metal-to-metal contact, and minimize noise from panel movements.

PART 3-EXECUTION

3.1 EXAMINATION

A. Do not begin installation of preformed metal wall panels until substrates have been properly prepared.

B. If substrate preparation is the responsibility of another installer, notify Architect Engineer of unsatisfactory preparation before proceeding.

3.2 PREPARATION

A. Coordinate panel work with provisions for flashing, trim, penetrations, and other adjoining work to assure that the completed installation will be free of leaks.

B. Separate dissimilar metals by applying a bituminous coating, self-adhering rubberized asphalt sheet, or other permanent method approved by wall panel manufacturer.

C. Where metal will be in contact with wood or other absorbent material subject to wetting, seal joints with sealing compound and apply one coat of heavy-bodied bituminous paint.

3.3 INSTALLATION

A. Overall: Install wall system in accordance with approved shop drawings and panel manufacturer's instructions and recommendations, as applicable to specific project conditions. Anchor all components of wall system securely in place while allowing for thermal and structural movement.
   1. Install wall system with concealed clips and fasteners, except as otherwise recommended by manufacturer for specific circumstances.
   2. Minimize field cutting of panels. Where field cutting is absolutely required, use methods that will not distort panel profiles. Use of torches for field cutting is absolutely prohibited.

B. Accessories: Install all components required for a complete wall assembly, including flashings, trim, moldings, closure strips, caps, rib closures, ridge closures, and similar wall panel accessory items.

3.4 CLEANING

A. Clean exposed sheet metal work at completion of installation. Remove grease and oil films, excess joint sealer, handling marks, and debris from installation, leaving the work clean and unmarked, free from dents, creases, waves, scratch marks, or other damage to the finish.

3.5 PROTECTION

A. Do not permit storage of materials or wall traffic on installed panels.
B. Touch-up, repair, or replace damaged wall panels or accessories before date of Substantial Completion.

END OF SECTION

PART 1 - GENERAL

1.1 SECTION INCLUDES

A. TPO Adhered membrane roofing system.

B. Cover board.

C. Roof insulation.

1.2 RELATED SECTIONS

A. Division 06 Section "06 1000" for wood nailers, cants, curbs, and blocking.

B. Division 07 Section "07 6500" for metal roof penetration flashings, flashings, and counter flashings.

1.3 REFERENCES

A. Roofing Terminology: Refer to the following publications for definitions of roofing work related terms in this Section:

1. ASTM D 1079 “Terminology Relating to Roofing and Waterproofing.”
2. Glossary of NRCA's "The NRCA Roofing and Waterproofing Manual."
3. Roof Consultants Institute “Glossary of Roofing Terms.”

B. Sheet Metal Terminology and Techniques: SMACNA Architectural Sheet Metal Manual.

1.4 DESIGN CRITERIA

A. General: Installed roofing membrane system shall remain watertight; and resist specified wind uplift pressures, thermally induced movement, and exposure to weather without failure.

B. Material Compatibility: Roofing materials shall be compatible with one another under conditions of service and application required, as demonstrated by roofing system manufacturer based on testing and field experience.

C. Wind Uplift Performance: Roofing system shall be identical to systems that have been successfully tested by a qualified testing and inspecting agency to resist wind uplift pressure calculated in accordance with ASCE 7.

1. Field-of-Roof Uplift Pressure: -19.70 lbf/sq. ft. (kN/sq. m).
2. Perimeter Uplift Pressure: -33.05 lbf/sq. ft. (kN/sq. m).
3. Corner Uplift Pressure: -49.74 lbf/sq. ft. (kN/sq. m).

1.5 SUBMITTALS

A. Product Data: Manufacturer's data sheets for each product to be provided.

B. Detail Drawings: Provide roofing system plans, elevations, sections, details, and details of attachment to other Work, including:

1. Base flashings, cants, and membrane terminations.
2. Tapered insulation, including slopes.
3. Crickets, saddles, and tapered edge strips, including slopes.
4. Insulation fastening patterns.

C. Verification Samples: Provide for each product specified.

D. Maintenance Data: Refer to Johns Manville's latest published documents on www.specJM.com.

E. Guarantees: Special guarantees specified in this Section.

1.6 QUALITY ASSURANCE

A. Installer Qualifications: Qualified firm that is approved, authorized, or licensed by roofing system manufacturer to install manufacturer's product and that is eligible to receive the specified manufacturer's guarantee.

B. Manufacturer Qualifications: Qualified manufacturer that has UL listing for roofing system identical to that used for this Project.

C. Testing Agency Qualifications: An independent testing agency with the experience and capability to conduct the testing indicated, as documented according to ASTM E 548.

D. Source Limitations: Obtain all components from the single source roofing manufacturer guaranteeing the roofing system. All products used in the system must be labeled by the single source roofing manufacturer issuing the guarantee.

E. Fire-Test-Response Characteristics: Provide roofing materials with the fire-test-response characteristics indicated as determined by testing identical products per test method below by UL[, FMG,] or another testing and inspecting agency acceptable to authorities having jurisdiction. Materials shall be identified with appropriate markings of applicable testing and inspecting agency.

1. Exterior Fire-Test Exposure: Class A; ASTM E 108, for application and roof slopes indicated.
2. Fire-Resistance Ratings: ASTM E 119, for fire-resistance-rated roof assemblies of which roofing system is a part.

1.7 DELIVERY, STORAGE, AND HANDLING

A. Deliver roofing materials in original containers with seals unbroken and labeled with manufacturer's name, product brand name and type, date of manufacture, and directions for storage.

B. Store liquid materials in their original undamaged containers in a clean, dry, protected location and within the temperature range required by roofing system manufacturer.

C. Protect roof insulation materials from physical damage and from deterioration by sunlight, moisture, soiling, and other sources. Comply with insulation manufacturer's written instructions for handling, storing, and protecting during installation.

D. Handle and store roofing materials and place equipment in a manner to avoid permanent deflection of deck.

1.8 PROJECT CONDITIONS

A. Weather Limitations: Proceed with installation only when current and forecasted weather conditions permit roofing system to be installed in accordance with manufacturer's written instructions and guarantee requirements.

1.9 GUARANTEE

A. Provide manufacturer's system guarantee equal to Johns Manville's Peak Advantage No Dollar Limit Roofing System Guarantee.

1. Single-Source special guarantee includes roofing membrane, flashings, roofing membrane accessories, roof insulation, fasteners, cover board, substrate board, vapor retarder, walkway products, manufacturer’s expansion joints, manufacturer’s edge metal products, and other single-source components of roofing system marketed by the manufacturer.

2. Guarantee Period: 20 years from date of Substantial Completion.

B. Installer’s Guarantee: Submit roofing Installer's guarantee, including all components of roofing system for the following guarantee period:

1. Guarantee Period: Two Years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 THERMOPLASTIC POLYOLEFIN ROOFING (TPO) MEMBRANE

A. Fabric-Reinforced Thermoplastic Polyolefin (TPO) Sheet: ASTM D 6878, uniform, flexible sheet formed from a thermoplastic polyolefin, internally fabric or scrim reinforced. Basis of Design: JM TPO

1. Thickness: 60 mils (1.52 mm), nominal.
2. Accelerated Weathering: Minimum of 24,000 hours without cracking or crazing as tested using ASTM G155.
3. Tensile Strength: Minimum of 300 lbf as tested using ASTM D751
4. Tearing Strength: Minimum of 85 lbs as tested using ASTM D751

2.2 AUXILIARY ROOFING MATERIALS

A. General: Auxiliary materials recommended by roofing system manufacturer for intended use and compatible with membrane roofing.

1. Liquid-type auxiliary materials shall meet VOC limits of authorities having jurisdiction.

B. Sheet Flashing: Manufacturer's sheet flashing of same material, type, reinforcement, thickness, and color as sheet membrane.

C. Sheet Flashing: Manufacturer's unreinforced sheet flashing of same material as sheet membrane.

D. Bonding Adhesive: Manufacturer's standard solvent-based bonding adhesive for membrane, and solvent-based bonding adhesive for base flashings.

E. Metal Termination Bars: Manufacturer's standard predrilled stainless-steel or aluminum bars, with anchors.

F. Fasteners: Factory-coated steel fasteners and metal or plastic plates meeting corrosion-resistance provisions in FMG 4470, designed for fastening membrane to substrate, and acceptable to membrane roofing system manufacturer.

G. Miscellaneous Accessories: Provide pourable sealers, preformed cone and vent sheet flashings, preformed inside and outside corner sheet flashings, T-joint covers, termination reglets, cover strips, and other accessories and JM Single Ply Caulk [or architect pre approved equals]

2.3 AUXILIARY ROOFING SYSTEM COMPONENTS

A. Expansion Joints: Provide factory fabricated weatherproof, exterior covers for expansion joint openings consisting of flexible rubber membrane, supported by a closed cell foam to form flexible bellows, with two metal flanges, adhesively and mechanically combined to the bellows by a bifurcation process. Provide product manufactured and marketed by single-source membrane supplier that is included in the No Dollar Limit guarantee.

B. Coping System: Manufacturer’s factory fabricated coping consisting of a base piece and a snap-on cap. Provide product manufactured and marketed by single-source membrane supplier that is included in the No Dollar Limit guarantee.

C. Fascia System: Manufacturer’s factory fabricated fascia consisting of a base piece and a snap-on cover. Provide product manufactured and marketed by single-source membrane supplier that is included in the No Dollar Limit guarantee.

D. Metal Flashing Sheet: Metal flashing sheet is specified in Division 07 Section "Sheet Metal Flashing and Trim."

2.4 COVER BOARD

A. High-Density Polyisocyanurate: ASTM C 1289, Type II, Class 4, Grade 3, High-density Polyisocyanurate technology bonded in-line to mineral-surfaced, fiber glass reinforced facers with greater than 140 lbs of compressive strength.

2.5 ROOF INSULATION

A. General: Preformed roof insulation boards that comply with requirements and referenced standards, selected from manufacturer's standard sizes and of thicknesses indicated.

B. Polyisocyanurate Board Insulation: ASTM C 1289, Type II,

1. Provide insulation package with R Value greater than **19**.

2.6 TAPERED INSULATION

A. Tapered Insulation: ASTM C 1289, provide factory-tapered insulation boards fabricated to slope of 1/4 inch per 12 inches (1:48), unless otherwise indicated.

2.7 INSULATION ACCESSORIES

A. General: Roof insulation accessories recommended by insulation manufacturer for intended use and compatible with membrane roofing.

B. Provide factory preformed saddles, crickets, tapered edge strips, and other insulation shapes where indicated for sloping to drain. Fabricate to slopes indicated.

C. Fasteners: Factory-coated steel fasteners and metal or plastic plates meeting corrosion-resistance provisions in FMG 4470, designed for fastening roof insulation to substrate, and furnished by roofing system manufacturer.

D. Urethane Adhesive: Manufacturer’s two component urethane adhesive formulated to adhere insulation to substrate.

E. Wood Nailer Strips: Comply with requirements in Division 06 Section **"**Miscellaneous Rough Carpentry**."**

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine substrates, areas, and conditions for compliance with requirements affecting performance of roofing system:

1. Verify that roof openings and penetrations are in place and set and braced and that roof drains are securely clamped in place.

2. Verify that wood cants, blocking, curbs, and nailers are securely anchored to roof deck at penetrations and terminations and that nailers match thicknesses of insulation.
3. Verify that surface plane flatness and fastening of steel roof deck complies with requirements in Division 05 Section "Steel Decking."

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

3.2 PREPARATION

A. Clean and remover from substrate sharp projections, dust, debris, moisture, and other substances detrimental to roofing installation in accordance with roofing system manufacturer's written instructions.

B. Prevent materials from entering and clogging roof scuppers.

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

3.3 INSULATION INSTALLATION

A. Coordinate installation of roof system components so insulation and cover board is not exposed to precipitation or left exposed at the end of the workday.

B. Comply with roofing system manufacturer's written instructions for installation of roof insulation and cover board.

C. Install tapered insulation under area of roofing to conform to slopes indicated.

D. Install insulation boards with long joints in a continuous straight line with end joints staggered between rows, abutting edges and ends between boards. Fill gaps exceeding 1/4 inch (6 mm) with like material.

E. Install one or more layers of insulation under area of roofing to achieve required thickness. Install 2 or more layers with joints of each succeeding layer staggered from joints of previous layer a minimum of 6 inches (150 mm) in each direction.

F. Trim surface of insulation boards where necessary at roof drains so completed surface is flush and does not restrict flow of water.

G. Install tapered edge strips at perimeter edges of roof that do not terminate at vertical surfaces.

H. Mechanically Fastened with Subsequent Layers Adhered Insulation: Secure first layer of insulation to deck using mechanical fasteners specifically designed and sized for fastening specified board-type to deck type.

1. Fasten first layer to resist uplift pressure at corners, perimeter, and field of roof.
2. Install subsequent layers in a two-part urethane adhesive according to roofing system manufacturer’s instruction.

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

3.4 COVER BOARD INSTALLATION

A. Coordinate installing membrane roofing system components so cover board is not exposed to precipitation or left exposed at the end of the workday.

B. Comply with membrane roofing system manufacturer's written instructions for installing roof cover board.

C. Install cover board with long joints of cover board in a continuous straight line with end joints staggered between rows, abutting edges and ends between boards. Fill gaps exceeding 1/4 inch (6 mm) with cover board.

1. Cut and fit cover board within 1/4 inch (6 mm) of nailers, projections, and penetrations.

D. Trim surface of cover board where necessary at roof drains so completed surface is flush and does not restrict flow of water.

1. Install tapered edge strips at perimeter edges of roof that do not terminate at vertical surfaces.

E. Adhered Cover Board: Adhere cover board to substrate as follows:

1. Install in a two-part urethane adhesive according to roofing system manufacturer’s instruction.

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

3.5 ROOFING MEMBRANE INSTALLATION, GENERAL

A. Install roofing membrane in accordance with roofing system manufacturer's written instructions, applicable recommendations of the roofing manufacturer and requirements in this Section.

B. Start installation of roofing membrane in presence of roofing system manufacturer's technical personnel.

C. Where roof slope exceeds 1/2 inch per 12 inches (1:24, contact the membrane manufacturer for installation instructions regarding installation direction and backnailing

D. Cooperate with testing and inspecting agencies engaged or required to perform services for installing roofing system.

E. Coordinate installing roofing system so insulation and other components of the roofing membrane system not permanently exposed are not subjected to precipitation or left uncovered at the end of the workday or when rain is imminent.

1. Provide tie-offs at end of each day's work to cover exposed roofing membrane sheets and insulation.
2. Complete terminations and base flashings and provide temporary seals to prevent water from entering completed sections of roofing system.
3. Remove and discard temporary seals before beginning work on adjoining roofing.

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

3.6 ADHERED ROOFING MEMBRANE INSTALLATION

A. Install roofing membrane specification ST6RA over area to receive roofing in accordance with membrane roofing system manufacturer's written instructions. Unroll roofing membrane and allow to relax before installing.

B. Start installation of roofing membrane in presence of membrane roofing system manufacturer's technical representative.

C. Accurately align roofing membrane and maintain uniform side and end laps of minimum dimensions required by manufacturer. Stagger end laps.

D. Bonding Adhesive: Apply solvent-based bonding adhesive to substrate and underside of roofing membrane at rate required by manufacturer and allow to partially dry before installing roofing membrane. Do not apply bonding adhesive to splice area of roofing membrane.

E. Mechanically fasten roofing membrane securely at terminations, penetrations, and perimeter of roofing.

F. Apply roofing membrane with side laps shingled with slope of roof deck where possible.

G. Seams: Clean seam areas, overlap roofing membrane, and hot-air weld side and end laps of roofing membrane according to manufacturer's written instructions to ensure a watertight seam installation.

1. Test lap edges with probe to verify seam weld continuity. Apply lap sealant to seal cut edges of roofing membrane.
2. Verify field strength of seams a minimum of twice daily and repair seam sample areas.

    a. Remove and repair any unsatisfactory sections before proceeding with Work.

3. Repair tears, voids, and lapped seams in roofing membrane that do not meet requirements.

H. Spread sealant or mastic bed over deck drain flange at deck drains and securely seal roofing membrane in place with clamping ring.

I. Install roofing membrane and auxiliary materials to tie in to existing roofing.

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

3.7 FLASHING INSTALLATION

A. Install sheet flashings and preformed flashing accessories and adhere to substrates according to membrane roofing system manufacturer's written instructions.

B. Apply solvent-based bonding adhesive to substrate and underside of sheet flashing at required rate and allow to partially dry. Do not apply bonding adhesive to seam area of flashing.

C. Flash penetrations and field-formed inside and outside corners with sheet flashing.

D. Flash penetrations and field-formed inside and outside corners with cured or uncured sheet flashing.

E. Clean seam areas and overlap and firmly roll sheet flashings into the adhesive. Weld side and end laps to ensure a watertight seam installation.

F. Terminate and seal top of sheet flashings and mechanically anchor to substrate through termination bars.

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

3.8 WALKWAY INSTALLATION

A. Flexible Walkways: Install walkway products in locations indicated. Adhere with compatible adhesive and heat weld walkway products to substrate according to roofing system manufacturer's written instructions.

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

3.9 FIELD QUALITY CONTROL

A. Testing Agency: Owner will engage a qualified independent testing and inspecting agency to perform roof tests and inspections and to prepare test reports.

B. Final Roof Inspection: Arrange for roofing system manufacturer's Registered Roof Observer (RRO) to inspect roofing installation on completion and submit report to Architect.

1. Notify Architect or Owner 48 hours in advance of date and time of inspection.

C. Repair or remove and replace components of roofing system where test results or inspections indicate that they do not comply with specified requirements.

D. Additional testing and inspecting, at Contractor's expense, will be performed to determine compliance of replaced or additional work with specified requirements.

3.10 PROTECTION AND CLEANING

A. Protect roofing system from damage and wear during remainder of construction period.

B. Clean overspray and spillage from adjacent construction using cleaning agents and procedures recommended by manufacturer of affected construction.

END OF SECTION

PART 1 GENERAL

1.01 SCOPE OF WORK

A. Furnishing of and paying for all labor, materials, services, equipment and appliances necessary for execution and completion of all work specified herein and shown on the drawings.

B. Section includes:
   1. Flexible Flashing as noted on drawings (not metal flashing) including generally the following:
      a. Flashing at all spandrels and spandrel angles.
      b. Flashing overhead of all doors, windows and other openings.
      c. Flashing under windows and other sills.
      d. Flashing at base of all walls, at bottom of cavities, etc.
      e. Flashing at all expansion joints at roof and walls to serve as condensation and water barrier.
      f. Membrane flashing or dampproofing shown on drawings and not specified under other sections of these specifications.

1.02 SUBMITTALS

A. Submit product data under provisions of Section 01 3000.

B. Product Data: Provide data on product characteristics, performance criteria and limitations.

1.03 PROJECT RECORD DOCUMENTS

A. Submit under provisions of 01 7200.

B. Submittals

1.04 DELIVERY, STORAGE AND HANDLING

A. Deliver, store, protect and handle products to site under provisions of Section 01 6000.

PART 2 PRODUCTS

2.01 MANUFACTURER

A. Fiberweb as manufactured by Fiberweb International Corporation as distributed by Dur-O-Wal, Inc.

B. Substitution: Under provisions of Section 01 6000.

2.02 MATERIAL

A. Fiberweb 200, a black composite of polyester film, 20 by 10 fiberglass scrim reinforcement and 1.25 mil vinyl ethylene film, average thickness of 8 mils.

2.03 ACCESSORIES

A. Flashing Tape: Fiberweb Flashing Tape, 2 mil polyester.

B. Sealant: As specified in Section 07 9200.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify items which penetrate surface to receive flashing are securely installed.

B. This work shall form a continuous barrier to the passage of water.

C. Pipes piercing this work will run in steel pipe sleeves set by the trade using them. This subcontractor will seal pipe and render watertight.

3.02 INSTALLATION

A. Install material in accordance with manufacturer's instructions.

B. Apply material, as and where shown on drawings or required, in as long lengths as possible (keep joints to minimum). Lap all joints 6 inches minimum and seal with flashing tape as instructed by manufacturer. NO EXCEPTIONS.

C. Place membrane into position without stretching. Do not place such that pockets will occur. Seal and turn up ends.

D. Extend over, under and behind members for watertight application.

E. Flashing shall be laid in a slurry of fresh mortar and topped with a fresh full bed of mortar. Flashing shall start 1/2 inch from the outside face of wall, carried through the wall, turning up where possible to facilitate flow through weep holes to outside. Turn up on back of wall not less than 2 inches or carry upward across cavity a minimum of 6 inches and secure to wall and steel beams with mastic or fusing solvent or reglet as per manufacturer's instructions.

F. Seal around all piercing items as manufacturer recommends.

G. At outside and inside corners: Flashing shall turn corners, lapped and seal joints to form a watertight installation. Flashing shall slope to drain to weep holes.

H. At heads and sill of windows and doors, flashing shall start 1/2 inch from outside face of wall, then thru wall turning up at the inside not less than 6 inches on each side of the opening. It shall be turned up at the ends forming a 2 inch deep pan running entirely thru the wall.

I. Repair all flashing material damaged with flashing tape.

3.03 CLEANING

A. Remove all debris from work site at completion of this work.

END OF SECTION

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

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

1.02 DEFINITIONS

A. Firestopping: Material or combination of materials used to retain integrity of fire-rated construction by maintaining an effective barrier against the spread of flame, smoke, and hot gases through penetrations in fire rated wall and floor assemblies.

1.03 GENERAL DESCRIPTION OF THE WORK OF THIS SECTION

Only tested firestop systems shall be used in specific locations as follows:

A. Penetrations for the passage of duct, cable, cable tray, conduit, piping, electrical busways and raceways through fire-rated vertical barriers (walls and partitions), horizontal barriers (floor/ceiling assemblies), and vertical service shaft walls and partitions.

B. Safing slot gaps between edge of floor slabs and curtain walls.

C. Openings between structurally separate sections of wall or floors.

D. Gaps between the top of walls and ceilings or roof assemblies.

E. Expansion joints in walls and floors.

F. Openings and penetrations in fire-rated partitions or walls containing fire doors.

G. Openings around structural members which penetrate floors or walls.

1.04 RELATED WORK OF OTHER SECTIONS

A. Coordinate work of this section with work of other sections as required to properly execute the work and as necessary to maintain satisfactory progress of the work of other sections.

1.05 REFERENCES

A. Test Requirements: ASTM E-814, "Standard Method of Fire Tests of Through Penetration Fire Stops" (July 1983).

B. Underwriters Laboratories (UL) of Northbrook, IL runs ASTM E-814 under their designation of UL 1479 and publishes the results in their "FIRE RESISTANCE DIRECTORY" that is updated annually with a midyear supplement.
   1. UL Fire Resistance Directory:
      a. Firestop Devices (XHJI)
      b. Fire Resistance Ratings (BXUV)
      c. Through-Penetration Firestop Systems (XHEZ)
      d. Fill, Voids, or Cavity Material (XHHW)
      e. Forming Materials (XHKU)

C. Test Requirements: UL 2079, “Tests for Fire Resistance of Building Joint Systems” (November 1994).

D. ASTM E-84, Standard Test Method for Surface Burning Characteristics of Building Materials.

E. Building codes: SBCCI

F. NFPA 101 - Life Safety Code

G. NFPA 70 - National Electric Code

1.06 QUALITY ASSURANCE

A. A manufacturer's direct representative (not distributor or agent) to be on-site during initial installation of firestop systems to train appropriate contractor personnel in proper selection and installation procedures. This will be done per manufacturer's written recommendations published in their literature and drawing details.

B. Firestop System installation must meet requirements of ASTM E-814, UL 1479 or UL 2079 tested assemblies that provide a fire rating equal to that of construction being penetrated.

C. Proposed firestop materials and methods shall conform to applicable governing codes having local jurisdiction.

D. Firestop Systems do not reestablish the structural integrity of load bearing partitions/assemblies, or support live loads and traffic. Installer shall consult the structural engineer prior to penetrating any load bearing assembly.

E. For those firestop applications that exist for which no UL tested system is available through any manufacturer, a manufacturer's engineering judgment derived from similar UL system designs or other tests will be submitted to local authorities having jurisdiction for their review and approval prior to installation. Engineer judgment drawings must follow requirements set forth by the International Firestop Council (September 7, 1994).

1.07 SUBMITTALS

A. Submit Product Data: Manufacturer's specifications and technical data for each material including the composition and limitations, documentation of UL firestop systems to be used and manufacturer's installation instructions to comply with Section 01 3000.

B. Manufacturer's engineering judgment identification number and drawing details when no UL system is available for an application. Engineer judgment must include both project name and contractor’s name who will install firestop system as described in drawing.

C. Submit material safety data sheets provided with product delivered to job-site.

1.08 INSTALLER QUALIFICATIONS

A. Engage an experienced Installer who is certified, licensed, or otherwise qualified by the firestopping manufacture as having been provided the necessary training to install manufacture’s products per specified requirements. A manufacture’s willingness to sell its firestopping products to the Contractor or to an Installer engaged by the Contractor does not in itself confer qualification on the buyer.

1.09 DELIVERY, STORAGE, AND HANDLING

A. Deliver materials undamaged in manufacturer's clearly labeled, unopened containers, identified with brand, type, and UL label where applicable.

B. Coordinate delivery of materials with scheduled installation date to allow minimum storage time at job-site.

C. Store materials under cover and protect from weather and damage in compliance with manufacturer's requirements.

D. Comply with recommended procedures, precautions or remedies described in material safety data sheets as applicable.

E. Do not use damaged or expired materials.

1.10 PROJECT CONDITIONS

A. Do not use materials that contain flammable solvents.

B. Schedule installation of firestopping after completion of penetrating item installation but prior to covering or concealing of openings.

C. Verify existing conditions and substrates before starting work. Correct unsatisfactory conditions before proceeding.

D. Weather conditions: Do not proceed with installation of firestop materials when temperatures exceed the manufacturer's recommended limitations for installation printed on product label and product data sheet.

E. During installation, provide masking and drop cloths to prevent firestopping materials from contaminating any adjacent surfaces.

PART 2 - PRODUCTS

2.01 FIRESTOPPING, GENERAL

A. Provide firestopping composed of components that are compatible with each other, the substrates forming openings, and the items, if any, penetrating the firestopping under conditions of service and application, as demonstrated by the firestopping manufacture based on testing and field experience.

B. Provide components for each firestopping system that are needed to install fill material. Use only components specified by the firestopping manufacture and approved by the qualified testing agency for the designated fire-resistance-rated systems.

C. Firestopping Materials are either “cast-in-place” (integral with concrete placement) or “post installed.” Provide cast-in-place firestop devices prior to concrete placement.

2.02 ACCEPTABLE MANUFACTURERS

A. Subject to compliance with through penetration firestop systems (XHEZ) listed in Volume II of the UL Fire Resistance Directory, provide products of the following manufacturers as identified below:
   1. Hilti, Inc., Tulsa, Oklahoma
      (800) 879-8000
   2. Tremco Sealants & Coatings, Beachwood, Ohio
      (216) 292-5000
   3. 3M Fire Protection Products, St. Paul, Minnesota
      (612) 736-0203

   Provide products from one of the three acceptable manufacturers; *no substitutions will be accepted.*

2.03 MATERIALS

A. Use only firestop products that have been UL 1479, ASTM E-814, or UL 2079 tested for specific fire-rated construction conditions conforming to construction assembly type, penetrating item type, annular space requirements, and fire-rating involved for each separate instance.

B. Cast-in place firestop devices for use with non-combustible and combustible plastic pipe (closed and open piping systems) penetrating concrete floors, the following products are acceptable:
   1. Hilti CP 680 Cast-In Place Firestop Device

C. For penetrations by non-combustible items including steel pipe, copper pipe, rigid steel conduit and electrical metallic tubing (EMT), the following materials are acceptable:
   1. Hilti FS 601 Elastomeric Firestop Sealant
   2. Hilti FS-ONE High Performance Intumescent Firestop Sealant
   3. Hilti CP 620 FireFoam
   4. 3M Fire Stop Sealant 2000
   5. 3M Fire Barrier CP25 WB
   6. Tremco Tremstop Fyre-Sil Sealant

D. For fire-rated construction joints and other gaps, the following materials are acceptable:
   1. Hilti FS 601 Elastomeric Firestop Sealant
   2. Hilti CP 601s Elastomeric Firestop Sealant
   3. Hilti CP 606 Flexible Firestop Sealant
   4. Hilti CP 672 Firestop Joint Spray
   5. Hilti CP 604 Self-leveling Firestop Sealant
   6. 3M Firestop Sealant 2000
   7. Tremco Tremstop Fyre-Sil Sealant

E. For penetrations by combustible items (penetrants consumed by high heat and flame) including insulated metal pipe, PVC jacketed, flexible cable or cable bundles and plastic pipe (closed piping systems), the following materials are acceptable:
   1. Hilti FS-ONE High Performance Intumescent Firestop Sealant
   2. Hilti CP 618 Firestop Putty
   3. Hilti CP 642 Firestop Jacket
   4. Hilti CP 643 Firestop Jacket
   5. 3M Fire Barrier CP25 WB
   6. 3M Fire Barrier FS-195 Wrap/Strip
   7. Tremco Tremstop WBM Intumescent Firestop Sealant

F. For penetrations by combustible plastic pipe (open piping systems), the following materials are acceptable:
   1. Hilti CP 642 Firestop Jacket
   2. Hilti CP 643 Firestop Jacket
   3. Hilti FS-ONE High Performance Intumescent Firestop Sealant
   4. 3M Fire Barrier PPD Plastic Pipe Device

G. For large size/complex penetrations made to accommodate cable trays, multiple steel and copper pipes, electrical busways in raceways, the following materials are acceptable:
   1. Hilti FS 635 Trowelable Firestop Compound
   2. Hilti FIRE BLOCK
   3. Hilti CP 620 FireFoam
   4. 3M Firestop Foam 2001
   5. 3M Fire Barrier CS-195 Composite Sheet

H. Provide a firestop system with a "F" Rating as determined by UL 1479 or ASTM E814 which is equal to the time rating of construction being penetrated.

I. Provide a firestop system with an Assembly Rating as determined by UL 2079 which is equal to the time rating of construction being penetrated.

PART 3 - EXECUTION

3.01 PREPARATION

A. Verification of Conditions: Examine areas and conditions under which work is to be performed and identify conditions detrimental to proper or timely completion.
   1. Verify penetrations are properly sized and in suitable condition for application of materials.
   2. Surfaces to which firestop materials will be applied shall be free of dirt, grease, oil, rust, laitance, release agents, water repellents, and any other substances that may affect proper adhesion.
   3. Provide masking and temporary covering to prevent soiling of adjacent surfaces by firestopping materials.
   4. Comply with manufacturer's recommendations for temperature and humidity conditions before, during and after installation of firestopping.
   5. Do not proceed until unsatisfactory conditions have been corrected.

3.02 COORDINATION

A. Coordinate location and proper selection of cast-in-place Firestop Devices with trade responsible for the work. Ensure device is installed before placement of concrete.

B. Responsible trade to provide adequate spacing of field run pipes to allow for installation of cast-in-place firestop devices without interference.

3.03 INSTALLATION

A. Regulatory Requirements: Install firestop materials in accordance with published "Through-Penetration Firestop Systems" in UL's Fire Resistance Directory.

B. Manufacturer's Instructions: Comply with manufacturer's instructions for installation of through-penetration materials.
   1. Seal all holes or voids made by penetrations to ensure an air and water resistant seal.
   2. Consult with mechanical engineer, project manager prior to installation of UL firestop systems that might hamper the performance of fire dampers as it pertains to duct work.
   3. Protect materials from damage on surfaces subjected to traffic.

3.04 FIELD QUALITY CONTROL

A. Examine sealed penetration areas to ensure proper installation before concealing or enclosing areas.

B. Keep areas of work accessible until inspection by applicable code authorities.

C. Perform under this section patching and repairing of firestopping caused by cutting or penetrating of existing firestop systems already installed by other trades.

3.05 ADJUSTING AND CLEANING

A. Remove equipment, materials and debris, leaving area in undamaged, clean condition.

B. Clean all surfaces adjacent to sealed holes and joints to be free of excess firestop materials and soiling as work progresses.

3.06 U.L. APPROVED SYSTEM SCHEDULE

SCHEDULES OF THROUGH PENETRATION FIRESTOP SYSTEMS

CONCRETE FLOORS		UL-CLASSIFIED SYSTEMS			CONCRETE OR BLOCK WALLS		UL-CLASSIFIED SYSTEMS		
TYPE PENETRA	F-RATIN	HILTI	3M	TREMCO	TYPE PENETRA	F-RATI	HILTI	3M	TREMCO

NT	G (HR)				NT	NG			
CIRCULAR BLANK OPENINGS	1	FA 0006, CAJ 0070	CAJ 0009	CAJ 0011	CIRCULAR BLANK OPENINGS	1	CAJ 0055, CAJ 0070	CAJ 0009	CAJ 0011
	2	FA 0006, CAJ 0070	CAJ 0009	CAJ 0011		2	CAJ 0055, CAJ 0070	CAJ 0009	CAJ 0011
	3	CAJ 0055	CAJ 0009	N/A*		3	CAJ 0055	CAJ 0009	N/A*
SINGLE METAL PIPES OR CONDUIT	1	CAJ 1226,CAJ 1382	CAJ 1058	CAJ 1064, CAJ 1302	SINGLE METAL PIPES OR CONDUIT	1	CAJ 1226, WJ 1021	CAJ 1058	CAJ 1064, CAJ 1302
	2	CAJ 1226, CAJ 1382	CAJ 1058	CAJ 1064, CAJ 1302		2	CAJ 1226, WJ 1021	CAJ 1058	CAJ 1064, CAJ 1302
	3	FA 1017,CAJ 1226,CAJ 1382	CAJ 1058	CAJ 1064		3	CAJ 1226, WJ 1041, WJ 1042	CAJ 1058	CAJ 1064
	4	CBJ 1037, CBJ 1034	CAJ 1044	CAJ 1064		4	CBJ 1034, CBJ 1037, WJ 1041, WJ 1042	CAJ 1044	CAJ 1064
SINGLE NON-METALLIC PIPE OR CONDUIT (I.E. PVC, CPVC, ABS, ENT)	1	FA 2053, CAJ 2109, CAJ 2098, CAJ 2141, CAJ 2167, CBJ 2021	CAJ 2189, CAJ 2117, CAJ 2027	CAJ 2075, CAJ 2116, CAJ 2229	SINGLE NON-METALLIC PIPE OR CONDUIT (I.E. PVC, CPVC, ABS, ENT)	1	CAJ 2109, CAJ 2098	CAJ 2189, CAJ 2117, CAJ 2027	CAJ 2075, CAJ 2116, CAJ 2229

	2	FA 2053, CAJ 2109, CAJ 2098, CAJ 2141, CAJ 2167, CBJ-2021	CAJ 2189, CAJ 2117	CAJ 2075, CAJ 2116, CAJ 2229, FA 2024		2	CAJ 2109, CAJ 2098	CAJ 2189, CAJ 2117, CAJ 2027	CAJ 2075, CAJ 2116, CAJ 2229
	3	FA 2054,CAJ 2109,CAJ 2098	CAJ 2005, CAJ 2117	CAJ 2075		3	CAJ 2109, CAJ 2098	CAJ 2005, CAJ 2117, CAJ 2027	CAJ 2075
	4	N/A*	N/A*	N/A*		4	WJ 2057	N/A*	N/A*
SINGLE OR BUNDLED CABLES	1	FA 3007,CAJ 3095,CAJ 3096	CAJ 3021	CAJ 3141	SINGLE OR BUNDLED CABLES	1	WJ 3036, CAJ 3095, CAJ 3096	CAJ 3021	CAJ 3141
	2	FA 3007,CAJ 3095,CAJ 3096	CAJ 3021	CAJ 3141		2	WJ 3036, CAJ 3095, CAJ 3096	CAJ 3021	CAJ 3141
	3	CAJ 3095, FA 3007	CAJ 3030	CAJ 3141		3	CAJ 3095, CAJ 3096	CAJ 3030	CAJ 3141
	4	N/A*	N/A*	N/A*		4	WJ 3050	N/A*	N/A*
CABLE TRAY	1	CAJ 4034, CAJ 4054	CAJ 4003	N/A*	CABLE TRAY	1	WJ 4016, CAJ 4034, CAJ 4054	CAJ 4003	WJ 4012
	2	CAJ 4034, CAJ 4054	CAJ 4003	N/A*		2	WJ 4016, CAJ 4034, CAJ 4054	CAJ 4003	WJ 4012
	3	CAJ 4034, CAJ	CAJ 4003	N/A*		3	CAJ 4034, CAJ	CAJ 4003	N/A*

		4035					4035		
	4	N/A*	N/A*	N/A*		4	WJ 8007	N/A*	N/A*
SINGLE INSULATED PIPES	1	FA 5015, FA 5016, CAJ 5090, CAJ 5091, CAJ 5098	CAJ 5080, CAJ 5024, CAJ 5017	CAJ 5111, CAJ 5121	SINGLE INSULATED PIPES	1	CAJ 5090, CAJ 5091, CAJ 5061	CAJ 5080, CAJ 5024, CAJ 5017	CAJ 5111, CAJ 5121
	2	FA 5015, FA 5016, CAJ 5090, CAJ 5091, CAJ 5098	CAJ 5080, CAJ 5024, CAJ 5017	CAJ 5111, CAJ 5121		2	CAJ 5090, CAJ 5091, CAJ 5061	CAJ 5080, CAJ 5024, CAJ 5017	CAJ 5111, CAJ 5121
	3	FA5016, CAJ 5090	CAJ 5024, CAJ 5017	N/A*		3	CAJ 5090, CAJ 5061	CAJ 5024, CAJ 5017	N/A*
	4	CBJ 5006	N/A*	N/A*		4	WJ 5028, CBJ 5006	N/A*	N/A*
ELECTRICAL BUSWAY	1	CAJ 6006, CAJ 6017	CAJ 6001, CAJ 6002	CAJ 6007	ELECTRICAL BUSWAY	1	CAJ 6006, CAJ 6017	CAJ 6001, CAJ 6002	CAJ 6007
	2	CAJ 6006, CAJ 6017	CAJ 6001, CAJ 6002	CAJ 6007		2	CAJ 6006, CAJ 6017	CAJ 6001, CAJ 6002	CAJ 6007
	3	CAJ 6006, CAJ 6017	CAJ 6001, CAJ 6002	CAJ 6007		3	CAJ 6006, CAJ 6017	CAJ 6001, CAJ 6002	CAJ 6007
NON-INSULATED MECHANICAL DUCTWORK WITHOUT DAMPERS	1	CAJ 7046 CAJ 7051	CAJ 7003, CAJ 7021	CAJ 7005, CAJ 7044	NON-INSULATED MECHANICAL DUCTWORK WITHOUT DAMPERS	1	CAJ 7046, CAJ 7051, WJ 7021, WJ 7022	CAJ 7003, CAJ 7021	CAJ 7005, CAJ 7044
	2	CAJ 7046 CAJ 7051	CAJ 7003, CAJ 7021	CAJ 7005, CAJ 7044		2	CAJ 7046, CAJ 7051,	CAJ 7003, CAJ 7021	CAJ 7005, CAJ 7044

							WJ 7021, WJ 7022		
	3	CAJ 7046 CAJ 7051	CAJ 7003, CAJ 7021	CAJ 7005		3	CAJ 7046, CAJ 7051	CAJ 7003, CAJ 7021	CAJ 7005
MIXED PENETRANTS	1	CAJ 8041, CAJ 8056,CAJ 8096	CAJ 8001, CAJ 8013	CAJ 8057	MIXED PENETRANTS	1	CAJ 8041, CAJ 8096,WJ 8007	CAJ 8001, CAJ 8013	CAJ 8057
	2	CAJ 8041,CAJ 8056,CAJ 8096	CAJ 8001, CAJ 8013	CAJ 8057		2	CAJ 8041, CAJ 8096,WJ 8007	CAJ 8001, CAJ 8013	CAJ 8057
	3	CAJ 8041, CAJ 8056	CAJ 8001, CAJ 8013	N/A*		3	CAJ 8041, CAJ 8056, WJ 8007	CAJ 8001, CAJ 8013	N/A*
	4	CBJ 8010	N/A*	N/A*		4	CBJ 8010, WJ 8007	N/A*	N/A*

WOOD FLOORS		UL-CLASSIFIED SYSTEMS			GYPSUM WALLBOARD ASSEMBLIES		UL-CLASSIFIED SYSTEMS		
TYPE OF PENETRANT	F-RATING	HILTI	3M	TREMCO	TYPE OF PENETRANT	F-RATING	HILTI	3M	TREMCO
METAL PIPES OR CONDUIT	1	FC 1009, FC 1059	FC 1002	FC 1050, FC 1054	METAL PIPES OR CONDUIT	1	WL 1054, WL 1058, WL 1164	WL 1146	WL 1158
						2	WL 1054, WL 1058, WL 1164	WL 1010, WL 1146	WL 1019, WL 1020, WL 1158
	2	FC 1009, FC 1059	FC 1002	N/A*		4	WL 1110, WL 1111	WL 1001	N/A*

NON-METALLIC PIPE OR CONDUIT	1	FC 2025, FC 2030	FC 2024	FC 2049, FC 2135	NON-METALLIC PIPE OR CONDUIT	1	WL 2078, WL 2075, WL 2128	WL 2088, WL 2002	WL 2083, WL 2129
						2	WL 2078, WL 2075, WL 2128	WL 2088, WL 2002	WL 2063, WL 2129, WL 2159
	2	FC 2025, FC 2029	FC 2024	FC 2049, FC 2083		4	WL 2184	N/A*	N/A*
SINGLE OR BUNDLED CABLES	1	FC 3012, FC 3044	FC 3017	FC 3037	SINGLE OR BUNDLED CABLES	1	WL 3065, WL 3111, WL 3112	WL 3032, WL 3030	WL 3131
						2	WL 3065, WL 3111, WL 3112	WL 3032, WL 3030	WL 3017, WL 3131
						4	WL 3139	N/A*	N/A*
	2	FC 3012	FC 3017	N/A*	CABLE TRAY	1	WL 4011,WL 4019,WL4054	WL 4004	N/A*
						2	WL 4011,WL 4019,WL4054	WL 4004	WL4012
						4	WL 8014	N/A*	N/A*
INSULATED PIPES	1	FC 5004, FC 5036, FC 5037	FC 5014	FC 5055	INSULATED PIPES	1	WL 5028, WL 5029, WL 5047	WL 5040, WL 5001, WL 5032	WL 5070, WL 5081

						2	WL 5028, WL 5029, WL 5047	WL 5040, WL 5001, WL 5032	WL 5070, WL 5081
	2	FC 5004, FC 5036, FC 5037	N/A*	N/A*		4	WL 5073	N/A*	N/A*

NON-INSULATED MECHANICAL DUCTWORK WITHOUT DAMPERS	1	FC 7013	FC 7001	N/A*	NON-INSULATED MECHANICAL DUCTWORK WITHOUT DAMPERS	1	WL 7017, WL 7040, WL 7042	WL 7008	WL 7039
						2 4	WL 7040, WL 7042	WL 7008, WL 7013, WL 7016	WL 7039
MIXED PENETRANTS	1	FC 8009, FC 8014	FC 8013	N/A*	MIXED PENETRANTS	1	WL 1095, WL 8013	WL 8010	N/A*
						2	WL 1095, WL 8013	WL 8010, WL 8002	N/A*
	2	N/A*	N/A*	N/A*		4 4	WL 8014 WL 8014	N/A*	N/A*

* No UL-Classified systems for this manufacturer. Engineer Judgement Drawing Required

NOTES:
1. Jobsite conditions of each through-penetration firestop system must meet ALL details of the UL-Classified System selected.
2. If jobsite conditions do not match any UL-classified systems in the schedules above, contact firestop manufacturer for alternative systems or Engineer Judgement Drawings.
3. Where more than one applicable UL-Classified System is listed in the schedules, choose the UL System which is most economical for each through-penetration firestop system.
4. Coordinate work with other trades to assure that penetration opening sizes are appropriate for penetrant locations, and vice versa.
5. For 3-hour rated gypsum walls, contact the firestop manufacturer for a UL-classified system or engineer judgement drawing.

SCHEDULES OF UL-2079 (DYNAMIC) JOINT FIRESTOP SYSTEMS

JOINT TYPE	F-RATING	UL-CLASSIFIED SYSTEM					
		JOINT WIDTH LESS THAN OR EQUAL TO 2"			JOINT WIDTH GREATER THAN 2", LESS THAN OR EQUAL TO 6"		
		HILTI	3M	TREMCO	HILTI	3M	TREMCO
CONCRETE FLOOR-TO-FLOOR	1	-	FF-D-0002	FF-D-0009	FF-D-1012, FF-D-1013	FF-D-1002, FF-D-1003, FF-D-1004	N/A**
	2	-	FF-D-0002	FF-D-0009	FF-D-1012, FF-D-1013	FF-D-1002, FF-D-1003, FF-D-1004	N/A**
	3	-	N/A**	FF-D-0010	FF-D-1011, FF-D-1026	N/A**	N/A**
EDGE OF CONCRETE FLOOR SLAB-TO-WALL (SEE NOTE 1 FOR CURTAIN WALLS)	1	-	-	N/A**	FW-D-1011, FW-D-1012, FW-D-1013, FW-D-1021	FW-D-1002, FW-D-1003, FW-D-1009	N/A**
	2	-	-	N/A**	FW-D-1011, FW-D-1012, FW-D-1013, FW-D-1021	FW-D-1002, FW-D-1003, FW-D-1009	N/A**
	3	-	-	N/A**	FW-D-1011, FW-D-1021	FW-D-1002, FW-D-1009	N/A**

CONCRETE OR BLOCK WALL TO CONCRETE OVER FLUTED METAL DECK (TOP-OF-WALL)	1	HW-D-0080, HW-D-0081, HW-D-0098, HW-D 0181	HW-D-0022, HW-D-0030, HW-D-0040HW-D-0013	HW-D-0092	N/A**
	2	HW-D-0080, HW-D-0081, HW-D-0098, HW-D 0181	HW-D-0022, HW-D-0030, HW-D-0040HW-D-0013	HW-D-0092	
	3	N/A**	N/A**	N/A**	

* SEE NOTE 6
** CONTACT MANUFACTURER FOR CURRENT UL-CLASSIFIED SYSTEM OR ENGINEER JUDGEMENT DRAWING

NOTES:
1. FOR EDGE OF SLAB JOINTS AT UNRATED CURTAIN WALLS, UTILIZE OMEGA POINT LABORATORIES DRAWING
CEJ-216P, OR CONTACT HILTI FOR AN ENGINEER JUDGEMENT DRAWING (1-800-879-8000.)
2. CLASSIFIED SYSTEMS FOR 2" - 6" WIDE JOINTS MAY BE USED FOR JOINTS 2" WIDE AND LESS.
3. CONFIRM THAT MOVEMENT CAPABILITIES OF THE SELECTED UL SYSTEM MEETS OR EXCEEDS THE SPECIFIED MOVEMENT RANGE OF THE PARTICULAR JOINT.
4. SYSTEMS MARKED WITH ASTERIK (*) ARE SUITABLE FOR TOP-OF-WALL JOINTS WHERE THE FLUTED METAL DECK HAS SPRAY-ON MONOKOTE MK-6/HY FIREPROOFING.
5. HEAD-OF-WALL SYSTEMS SPECIFIED ONLY FOR 2- OR 3-HR SYSTEMS MAY NOT BE SUITABLE FOR MASONRY WALLS OR GYPSUM WALL ASSEMBLIES WITH LOWER HOURLY RATINGS.
CONTACT THE FIRESTOP MANUFACTURER FOR CLARIFICATION

END OF SECTION

PART 1 - GENERAL

1.01 SCOPE OF WORK

A. Furnishing of and paying for all labor, services, appliances, materials, and equipment necessary for execution, installation, and completion of all work specified herein and as shown on drawings.

B. Section includes:
1. Preparing substrate surfaces.
2. Sealants
3. Sealant required around perimeter of frames and devices at openings in exterior walls, such as door frames, louvers, stationary glass, metal, and frames.
4. Sealant required around perimeter of frames and devices at interior walls such as door frames, borrowed light frames, glass openings, metal frames, or devices in walls.
5. Joints between abutting parts of dissimilar exterior materials such as concrete block/concrete, steel angles concrete, including any other joints normally sealed of dissimilar materials.
6. Isolation, relief or expansion joints, interior or exterior, in same material or between dissimilar materials, including relief or construction joints in concrete floors, concrete block, brick, and gypsum partitions.
7. Metal flashing, and wall caps into reglets.
8. Sealant required around perimeter of plumbing fixtures, solid surfacing tops, millwork countertops and other sanitary locations.
9. Isolation, relief or expansion joints, between new/new construction.
10. Joint packing, primer and other items necessary or incidental to completion of this work.
11. Sealants at top of masonry walls to deck above.
12. Joints at thresholds.
13. Removal and complete replacement of existing sealants disturbed by construction of new work.
14. Other points and/or joints normally sealed unless specified elsewhere.

1.02 REFERENCES

A. American Society for Testing and Materials (ASTM):
1. C920 - Specification for Elastomeric Joint Sealants (Multi-Component) Type M, Grade NS, Class 25
2. C920, Type S, Grade NS, Class 25 - Specification for Elastomeric Joint Sealant (Single Component)
3. C920, Type S, Grade NS, Class 25 - Specification for Elastomeric Joint Sealant (Silicone Type)
4. C881 – Epoxy-Resin-Base Bonding Systems for Concrete

1.03 SUBMITTALS

A. Submit under provisions of Section 01 3000.

B. Product Data: Indicate sealant chemical characteristics, performance criteria, limitations, and color availability.

C. Samples: Submit three (3) samples illustrating sealant for colors selected.

D. Manufacturer’s Installation Instructions: Indicate special procedures, surface preparation, perimeter conditions requiring special attention.

E. Applicator/Manufacturer Certification: Submit as per Article 1.06.

F. Applicator Certification: Submit as per Article 1.07.

G. Manufacturer’s certification that products meet or exceed specified requirements.

1.04 PROJECT RECORD DOCUMENTS

A. Submit under provisions of Section 01 7200.

B. Submittals

C. Manufacturer’s Field Report (Para. 3.01A)

1.05 PROJECT WARRANTIES, OPERATION AND MAINTENANCE DATA

A. Submit under provisions of Section 01 7250.

B. Warranty (Article 1.12)

1.06 QUALITY ASSURANCE

A. Perform work in accordance with sealant manufacturer's requirements for preparation of surfaces and materials installation instructions.

B. Applicator/Manufacturer Certification: Submit written certification from the Applicator and his Material Manufacturer (that he proposes to utilize) that they have jointly reviewed and agree with the entire Contract Documents relative to the sealant materials and the application of same as specified herein or shown on the drawings.

C. Certification must be furnished with Submittals (Article 1.03).

1.07 QUALIFICATIONS

A. Applicator: Company specializing in performing the work of this section with a minimum of five years documented experience and certified approved applicator by the manufacturer.

B. Architect may request the applicator to provide a list of complete projects similar to the work of the Section.

C. Certification must be furnished with Submittals (Article 1.03).

1.08 DELIVERY, STORAGE AND HANDLING

A. Deliver, store, protect and handle products to site under provisions of Section 01 6000.

B. Store material to protect against weather damage, direct sunlight, at temperature range of 40 degrees F to 90 degrees F.

1.09 ENVIRONMENTAL CONDITIONS

A. Sealant shall not be applied below 40 degrees F; surfaces to receive sealant must be clean, dry and frost free.

B. Surfaces to receive sealant must be structurally sound, free of dirt, loose particles, oil, grease, asphalt, tar, paint, wax, rust, release agents and curing compounds.

C. Do not apply during inclement weather.

1.10 MOCKUP

A. Provide samples under provisions of Section 01 4000.

B. Construct mockup with specified sealant types and with the components noted.

C. Locate where directed.

D. Mockup may remain as part of work.

1.11 COORDINATION

A. Coordinate work under provisions of Section 01 3900.

B. Coordinate the work of the Section with all Sections referencing this Section.

1.12 WARRANTY

A. Provide Warranty that this work will remain water and weathertight for five (5) years from date of Certificate of Substantial Completion.

B. If failure occurs within this period for reason other than that of structural failure, this contractor must immediately repair and/or replace as required to return to acceptance integrity.

PART 2 - PRODUCTS

2.01 SEALANTS (Exterior or Interior Sealants)

A. Manufacturer: Mameco International, Inc.

B. Exterior: One-part moisture curing, gun grade, polyurethane sealant conforming to ASTM C290, Type S, Grade NS, Class 25, Vulkem 116 in manufacturer’s standard colors.

C. Interior: Two-part chemically curing, gun grade, polyurethane sealant conforming to ASTM C290, Type M, Grade NS, Class 25, Vulkem 922, with special mixed colors.

D. Exterior Concrete: Tremco THC 900/901 two-component, self-leveling caulk.

E. Other acceptable manufacturers offering equivalent products:
   1. ChemRex, Inc., Sonneborn Building Products
   2. Exterior: Sonolastic NP2, two-part polyurethane
   3. Interior: Sonolastic NP1, one-part polyurethane

F. Substitution: Under provisions of Section 01 6000.

2.02 SEALANTS (At Plumbing Fixtures)

A. Manufacturer: General Electric Co., Silicone Products Division.

B. One-part moisture curing, gun grade, fungus resistant, silicone selant conforming to ASTM C290, Type S, Grade NS, Class 25, in manufacturer's standard colors..

C. Substitution: Under provisions of Section 01 6000.

2.03 COLOR SELECTION

A. Exterior Sealant: Shall match color of adjacent material. Sealant will be selected from manufacturer's standard color.

B. Interior Sealant:
1. Shall match color to adjacent wall and plastic laminate using special mixed color sealant.
2. Where adjacent materials on each side of the joint are of different colors, the sealant color shall be as directed by the Architect.

C. Sealant at Plumbing Fixtures: Shall match color of plumbing fixtures or be clear.

D. The Architect will make final selection of and approve all sealant colors.

2.04 ACCESSORIES

A. Primer: Non-staining type, recommended by sealant manufacturer to suit application.

B. Joint Cleaner: Non-corrosive and non-staining type, recommended by sealant manufacturer; compatible with joint forming materials.

C. Joint Backing: Equal to Sonofoam soft backer-rod constructed of extruded polyethylene foam or Sonofoam Closed Cell (CC) backer-rod constructed of extruded closed cell polyethylene foam compatible with all products specified herein. Use in proper size for condition.

D. Bond Breaker: Pressure sensitive tape recommended by sealant manufacturer to suit application.

E. Pre-molded bituminous fiber filler for exterior concrete joints.

PART 3 - EXECUTION

3.01 MANUFACTURE'S FIELD SERVICE AND REPORTS

A. Manufacturer's Responsibility
1. The Manufacturer's "Technical" Representative is to provide an "on site" job inspection of the project prior to the start of this work, to ensure that any physical conditions which would result in defective work are properly corrected before his materials are applied. The Manufacturer and Subcontractor will ensure that properly instructed personnel are available to do the work and the proper procedures are being followed. Such inspection shall be reported, in writing, to the Architect before proceeding with the work.
2. This Contractor shall notify the Manufacturer and Architect at least 72 hours prior to the time inspection is required.
3. Failure or refusal of the manufacturer to provide the inspection and supervision as required by the Article or certification as required by this Specification shall constitute grounds for

non-acceptability of materials manufactured by him even though such manufacturers have been specified and approved.

4. Beginning of installation means installer accepts existing substrate.

3.02 PREPARATION

A. Joint preparation, including cleaning and priming, shall be performed in accordance with the manufacturer's written instructions. When solvents are used, the applicator shall exercise special care to wipe the dissolved contaminant and solvent from the surface. Sealant will not be allowed to remain on exposed surfaces.

B. Remove loose joint material and foreign matter which might impair adhesion of sealant.

C. Clean and prime joints in accordance with manufacturer's instructions.

D. Verify that joint backing and release tapes are compatible with sealant.

E. Perform preparation in accordance with manufacturer's instructions.

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

3.03 INSTALLATION

A. Install sealant in accordance with manufacturer's instructions.

B. Measure joint dimensions and size materials to achieve required 2:1 width/depth ratios.

C. Install joint backing to achieve a neck dimension no greater than 1/3 of the joint width.

D. Install bond breaker where joint backing is not used.

E. Joint of excessive depth must be brought to proper depth by driving in continuous joint backing of proper size. Joint backing shall be accurately positioned with the joint to establish and control the uniform designated thickness of the sealant. Exercise care in the installation of the joint backing to see that the backing is not set too far below the surface, thereby increasing the depth of the sealant. Depth of sealing compounds will be maintained in accord with the manufacturer's instructions relative to ratio of width to depth. All joint backing shall be used 30 percent under compression and care shall be taken that the backing is not stretched so that it will, at a later time, recover and damage the sealant applied over it.

F. Install sealant with sufficient pressure to completely fill the void space and to assure complete wetting of contact area to obtain uniform adhesion. During the application, keep tip of nozzle at the bottom of joint, forcing sealant to fill from bottom to top. Move tip along joint at a rate as to completely fill the joint.

G. Tool all sealants smooth and concave with adjacent surfaces unless detailed to be finished below the surface.

3.04 CLEANING AND REPAIRING

A. Clean work under provisions of Section 01 7000.

B. Clean adjacent soiled surfaces.

C. Repair or replace defaced or disfigured finishes caused by work of this Section.

3.05 PROTECTION OF FINISHED WORK

A. Protect finished installation under provisions of Section 01 5000.

B. Protect sealants until cured.

END OF SECTION

PART 1 - GENERAL

1.01 SCOPE OF WORK

A. Furnishing of and paying for all labor, materials, services, equipment and appliances necessary for execution and completion of all work specified herein and shown on the drawings.

B. Section includes:
1. Labeled and non-labeled hollow metal doors.
2. Metal frames for metal doors, wood doors..
3. Anchors, reinforcing and their attachment required.

1.02 REFERENCES

A. ANSI/SDI-100 - Standard Steel Doors and Frames

B. ASTM E152 - Methods of Fire Tests of Door Assemblies

C. DHI - Door Hardware Institute: The Installation of Commercial Steel Doors and Steel Frames, Insulated Steel Doors in Wood Frames and Builder's Hardware.

D. NFPA 80 - Fire Doors and Windows

E. NFPA 252 - Fire Tests for Door Assemblies

F. SDI-105 - Recommended Erection Instructions for Steel Frames

G. UL 10B - Fire Tests of Door Assemblies

1.03 SUBMITTALS

A. Submit under provisions of Section 01 3000.

B. Shop Drawings:
1. Indicate frame configuration, anchor types and spacings, location of cutouts for hardware, reinforcement, and finish.
2. Indicate door elevations, internal reinforcement, closure method, and cut outs for glazing and louvers, and finish.

1.04 PROJECT RECORD DOCUMENTS

A. Submit under provisions of 01 7200.

B. Submittals

1.05 QUALITY ASSURANCE

A. Conform to requirements of ANSI/SDI-100 and ANSI A117.1

B. Fire rated door and frame construction to conform to ASTM E152 and UL 10B.

C. Installed fire rated frame assembly to conform to NFPA 80 for fire rated class indicated in schedule shown on drawings.

1.06 REGULATORY REQUIREMENTS

A. Conform to applicable code for fire rated frames.

1.07 DELIVERY, STORAGE AND HANDLING

A. Deliver, store, protect and handle products to site under Section 01 6000.

B. Frames shall be delivered to the job site; handled so as to avoid damage; stored upright in a protected area under cover on wood skids; and vented to avoid condensation until ready for installation. Damaged materials shall be removed from premises.

1.08 FIELD MEASUREMENTS

A. Verify that field measurements are as indicated on shop drawings.

PART 2 - PRODUCTS

2.01 MANUFACTURERS

A. Steel doors and frames shall be equivalent to Steelcraft Series as manufactured by Steelcraft Manufacturing Co., Cincinnati, Ohio.

2.02 HOLLOW METAL DOORS (LABELED AND NON-LABELED)

A. Interior doors shall be 1-3/4” thick, SDI 100, Heavy Duty, 16 gauge minimum.

B. Exterior doors shall be 1-3/4” thick, SDI 100, Heavy Duty, Model 2 Seamless Design, galvanized all surfaces and edges, 16 gauge minimum, filled with rigid insulating foam.

C. Fabricate exterior doors, panels and frames from galvanized sheet steel. Close top and bottom edges of exterior doors as integral part of door construction or by addition of minimum 14 gauge inverted steel channels.

D. Hardware Reinforcing: Hardware reinforcing for doors shall comply with Steel Door Institute requirements as noted herein:
   1. Hinges - 8 gauge
   2. Lock - 16 gauge
   3. Closer - 14 gauge
   4. Panic bolts and guides - 14 gauge
   5. In addition to above, top hinge reinforcement shall receive a 10 gauge backup plate welded to the hinge reinforcement and extended to top of door and welded at 3 extra points on the extended leg.

E. Edge Clearances:
   1. Between doors and frame at head and jamb: 1/8 inch
   2. At sills without thresholds: 3/8 inch maximum
   3. At sills with thresholds: 1/4 inch including maximum between threshold and door.
   4. Between meeting edges of pairs of doors: 1/8 inch.

2.03 STEEL FRAMES (LABELED AND NON-LABELED)

A. All metal frames shall be of size and type as shown on drawings and listed on door schedule and as follows:
   1. Non-labeled metal frames (interior and exterior)
      a. Frames shall be SDI-100, Grade III-Extra Heavy Duty. Exterior frames shall be galvanized.
      b. Frames to be 16 gauge on interior and 14 gauge on exterior.
      c. Frames shall have 2-inch face set-up and arc welded. Mitered corners shall have reinforcement with four integral tabs interlocking of jamb to head.
      d. Strike jambs of all single opening frames are to be provided with three (3) factory installed rubber door silencers. Frames for pairs of doors are to be provided with two (2) factory installed rubber door silencers at the heads of doors.
      e. Frames shall have the following concealed reinforcements:
         1) Metal plaster guards shall be provided for all mortised cutouts.
         2) All drilled and tapped to receive mortise hardware as required by hardware templates and drawings and as follows:
         3) Hinge reinforcement - 8 gauge with top hinge reinforcement to receive a 10 gauge stiffener welded to the back side of the face of the frame, to the back of the reinforced unit and to the back side of the rabbet on the opposite side of the frame.
         4) Strike reinforcements - 16 gauge
         5) Surface applied hardware shall be reinforced with 14 gauge steel.
      f. Anchors - Provide "Standard" as required by wall conditions to give firm attachment not less than 3 anchors per side of frame. Provide angle floor clips at bottom of all jamb members.
   2. Labeled Metal Frames:
      a. Shall meet the same requirements as non-labeled door frames including having label affixed and shall be of the same appearance as other frames.

2.04 PROTECTIVE COATINGS

A. All frames, and frame components shall be cleaned, phosphatized and finished as standard with one coat of baked-on rust inhibiting prime paint in accordance with the ANSI A224.1 "Test Procedure and Acceptance Criteria for Prime Painted Steel Surfaces for Steel Doors and Frame."

PART 3 - EXECUTION

3.01 EXAMINATION

A. Verify substrate conditions under provisions of Section 01 1000.
B. Verify that opening sizes and tolerances are acceptable.

C. Verify that the rough opening sizes are correct for drywall frames.

3.02 INSTALLATION

A. Install frames in accordance with ANSI/SDI-100 and DHI.

B. Coordinate with wall construction for anchor placement.

C. Coordinate installation of frames with installation of hardware specified in Section 08 7100.

D. Install roll formed steel reinforcement channels between two abutting frames. Anchor to structure and floor.

E. Install drywall frames in accordance with manufacturer's directions.

3.03 ERECTION TOLERANCES

A. Maximum Diagonal Distortion: 1/16 inch measured with straight edges, crossed corner to corner.

3.04 CLEANING

A. Upon completion of the work of this section, remove from the premises all debris relating to the conduct of this portion of the work.

END OF SECTION

PART 1 - GENERAL

1.01 SCOPE OF WORK

A. Furnishing of and paying for all labor, materials, services, equipment and appliances necessary for execution and completion of all work specified herein and shown on the drawings.

B. Section includes:
1. Labeled hollow metal doors.
2. Metal frames for metal doors.
3. Anchors, reinforcing and their attachment required.
4. Removable stops, subframes, pressed steel trim, rough bucks, etc.

1.02 REFERENCES

A. ANSI/SDI-100 - Standard Steel Doors and Frames

B. ASTM E152 - Methods of Fire Tests of Door Assemblies

C. DHI - Door Hardware Institute: The Installation of Commercial Steel Doors and Steel Frames, Insulated Steel Doors in Wood Frames and Builder's Hardware.

D. NFPA 80 - Fire Doors and Windows

E. NFPA 252 - Fire Tests for Door Assemblies

F. SDI-105 - Recommended Erection Instructions for Steel Frames

G. UL 10B - Fire Tests of Door Assemblies

H. ANSI ICC500, 250 MPH

1.03 SUBMITTALS

A. Submit under provisions of Section 01 3000.

B. Shop Drawings:
1. Indicate frame configuration, anchor types and spacings, location of cutouts for hardware, reinforcement, and finish.
2. Indicate door elevations, internal reinforcement, closure method, and cut outs for glazing and louvers, and finish.

1.04 PROJECT RECORD DOCUMENTS

A. Submit under provisions of 01 7200.

B. Submittals

1.05 QUALITY ASSURANCE

A. Conform to requirements of ANSI/SDI-100 and ANSI A117.1

B. Fire rated door and frame construction to conform to ASTM E152 and UL 10B.

C. Installed fire rated frame assembly to conform to NFPA 80 for fire rated class indicated in schedule shown on drawings.

1.06 REGULATORY REQUIREMENTS

A. Conform to applicable code for fire rated frames.

1.07 DELIVERY, STORAGE AND HANDLING

A. Deliver, store, protect and handle products to site under Section 01 6000.

B. Frames shall be delivered to the job site; handled so as to avoid damage; stored upright in a protected area under cover on wood skids; and vented to avoid condensation until ready for installation. Damaged materials shall be removed from premises.

1.08 FIELD MEASUREMENTS

A. Verify that field measurements are as indicated on shop drawings.

PART 2 - PRODUCTS

2.01 MANUFACTURERS

A. Tornado Door Systems comply with Federal Emergency Management Agency (FEMA) 361 Guidelines and provides the highest level of security for tornado shelters and severe storm areas of refuge.

B. Steel doors and frames shall be equivalent to Steelcraft Paladin PW Series as manufactured by Steelcraft Manufacturing Co., Cincinnati, Ohio.

2.02 HOLLOW METAL DOORS

A. Interior doors shall be 1-3/4” thick, SDI 100, Heavy Duty, 16 gauge minimum.

B. Hardware Reinforcing: Hardware reinforcing for doors shall comply with Steel Door Institute requirements as noted herein:
   1. Hinges - 7 gauge
   2. Lock - 16 gauge
   3. Closer - 14 gauge
   4. Panic bolts and guides - 14 gauge
   5. In addition to above, top hinge reinforcement shall receive a 10 gauge backup plate welded to the hinge reinforcement and extended to top of door and welded at 3 extra points on the extended leg.

C. Edge Clearances:
   1. Between doors and frame at head and jamb: 1/8 inch
   2. At sills without thresholds: 3/8 inch maximum

2.03 STEEL FRAMES (LABELED)

A. All metal frames shall be of size and type as shown on drawings and listed on door schedule and as follows:
   1. Labeled metal frames interior, including having label affixed and shall be of the same appearance as other frames.
      a. Frames shall be SDI-100, Grade III-Extra Heavy Duty.
      b. Frames to be 14 gauge on interior.
      c. Frames shall have 2-inch face set-up and arc welded. Mitered corners shall have reinforcement with four integral tabs interlocking of jamb to head.
      d. Strike jambs of all single opening frames are to be provided with three (3) factory installed rubber door silencers. Frames for pairs of doors are to be provided with two (2) factory installed rubber door silencers at the heads of doors.
      e. Frames shall have the following concealed reinforcements:
         1) Metal plaster guards shall be provided for all mortised cutouts.
         2) All drilled and tapped to receive mortise hardware as required by hardware templates and drawings and as follows:
         3) Hinge reinforcement - 7 gauge with top hinge reinforcement to receive a 10 gauge stiffener welded to the back side of the face of the frame, to the back of the reinforced unit and to the back side of the rabbet on the opposite side of the frame.
         4) Strike reinforcements - 16 gauge
         5) Surface applied hardware shall be reinforced with 14 gauge steel.
      f. Anchors - Provide "Standard" as required by wall conditions to give firm attachment not less than 3 anchors per side of frame. Provide angle floor clips at bottom of all jamb members.

2.04 PROTECTIVE COATINGS

A. All frames, and frame components shall be cleaned, phosphatized and finished as standard with one coat of baked-on rust inhibiting prime paint in accordance with the ANSI A224.1 "Test Procedure and Acceptance Criteria for Prime Painted Steel Surfaces for Steel Doors and Frame."

PART 3 - EXECUTION

3.01 EXAMINATION

A. Verify substrate conditions under provisions of Section 01 1000
.

B. Verify that opening sizes and tolerances are acceptable.

C. Verify that the rough opening sizes are correct.

3.02 INSTALLATION

A. Install frames in accordance with ANSI/SDI-100 and DHI.

B. Coordinate with wall construction for anchor placement.

C. Coordinate installation of frames with installation of hardware specified in Section 08 7100.

D. Install roll formed steel reinforcement channels between two abutting frames. Anchor to structure and floor.

3.03 ERECTION TOLERANCES

A. Maximum Diagonal Distortion: 1/16 inch measured with straight edges, crossed corner to corner.

3.04 CLEANING

A. Upon completion of the work of this section, remove from the premises all debris relating to the conduct of this portion of the work.

END OF SECTION

PART 1 - GENERAL

1.01 SUMMARY

A. Assembly performance to achieve required fire rating for door and frame assembly as indicated on drawings.

1.02 SUBMITTALS

A. Shop Drawings: Indicated door elevations, internal blocking for hardware attachment, and cutouts for glazing and louvers.

B. Product Data: Provide manufacturers data and installation instructions.

1.03 QUALITY ASSURANCE

A. Perform Work in accordance with the following:

1. AWI – Quality Standards Section 1300 and 1400, Custom Grade.
2. NWWDA – National Wood Window Door Association

1.04 WARRANTY

A. Life of Installation: Interior doors.

B. Include coverage for delimitation of veneer, warping beyond specified installation tolerance, defective materials, and telegraphing core construction.

PART 2 - PRODUCTS

2.01 SOLID CORE FLUSH WOOD DOOR

A. Manufacturers/Product:

1. Weyerhaeuser Company Inc.; FLUSH.

B. Flush Interior Doors: Seven ply, 1-3/4 inches thick; particle board core, solid core construction.

C. Core Solid, Non-Rated: Particleboard core; finger jointed.

D. Flush Door Facing: Wood veneer; NWWDA Custom Economy grade, birch species wood, stain grade, color to be selected.

E. Adhesive: NWWDA, Type I.

F. Fabricate doors in accordance with AWI Quality standards.

G. Provide doors with ½ inch thick edge strips of wood species to match face veneer.

H. Pre-machine doors for finish hardware in accordance with AWI requirements.

I. Door vertical edge band and top and bottom shall be solid wood construction.

2.02 FINISH

A. Flush Interior Doors: Stain grade for stain finish.

2.03 GLASS OPENINGS

A. Door manufacturer shall make all glass cutouts to size and location shown on the drawings.

PART 3 - EXECUTION

3.02 EXAMINATION AND PREPARATION

A. Condition doors to average prevailing humidity in installation prior to hanging.

3.03 INSTALLATION

A. Install doors in accordance with NWWDA I.S.1. requirements and manufacturer's instructions.

3.04 INSTALLATION TOLERANCES

A. Conform to NWWDA requirements for fit and clearance tolerances and maximum diagonal distortion.

B. Maximum Diagonal Distortion: 1/16 inch measured with straight edge, corner to corner.

3.05 ADJUST AND CLEAN

A. Adjust door for smooth and balanced movement

B. Rehang or replace doors which do not swing or operate freely.

END OF SECTION

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Glazed Aluminum Sectional Overhead Doors

B. Electric Operators and Controls.

C. Operating Hardware, tracks, and support.

1.2 RELATED SECTIONS

A. Section 03300 - Cast-In-Place Concrete: Prepared opening in concrete. Execution requirements for placement of anchors in concrete wall construction.

B. Section 04810 - Unit Masonry Assemblies: Prepared opening in masonry. Execution requirements for placement of anchors in masonry wall construction.

C. Section 05500 - Metal Fabrications: Steel frame and supports.

D. Section 06114 - Wood Blocking and Curbing: Rough wood framing and blocking for door opening.

E. Section 07900 - Joint Sealers: Perimeter sealant and backup materials.

F. Section 08710 - Door Hardware: Cylinder locks.

G. Section 09900 - Paints and Coatings: Field painting.

H. Section 11150 – Parking Control Equipment: Remote door control.

I. Section 16130 - Raceway and Boxes: Empty conduit from control station to door operator.

J. Section 16150 - Wiring Connections: Electrical service to door operator.

1.3 REFERENCES

A. ANSI/DASMA 102 - American National Standard Specifications for Sectional Overhead Type Doors.

1.4 DESIGN / PERFORMANCE REQUIREMENTS

A. Wind Loads: Design and size components to withstand loads caused by pressure and suction of wind acting normal to plane of wall as calculated in accordance with applicable code.
   1. Design pressure of 19.7 lb/sq ft (0.94 kPa).

B. Wiring Connections: Requirements for electrical characteristics.
   1. 208 volts, single phase, 60 Hz (190-207V range)

C. Single-Source Responsibility: Provide doors, tracks, motors, and accessories from one manufacturer for each type of door. Provide secondary components from source acceptable to manufacturer of primary components.

1.5 SUBMITTALS

A. Submit under provisions of Section 013000.

B. Product Data: Manufacturer's data sheets on each product to be used, including:
1. Preparation instructions and recommendations.
2. Storage and handling requirements and recommendations.
3. Installation methods.

C. Shop Drawings: Indicate plans and elevations including opening dimensions and required tolerances, connection details, anchorage spacing, hardware locations, and installation details.

D. Manufacturer's Certificates: Certify products meet or exceed specified requirements.

E. Operation and Maintenance Data.

1.6 QUALITY ASSURANCE

A. Manufacturer Qualifications: Company specializing in manufacturing products specified in this section with minimum five years documented experience.

B. Installer Qualifications: Authorized representative of the manufacturer with minimum five years documented experience.

C. Products Requiring Electrical Connection: Listed and classified by Underwriters Laboratories, Inc. acceptable to authority having jurisdiction as suitable for purpose specified.

1.7 DELIVERY, STORAGE, AND HANDLING

A. Store products in manufacturer's unopened labeled packaging until ready for installation.

B. Protect materials from exposure to moisture until ready for installation.

C. Store materials in a dry, ventilated weathertight location.

1.8 PROJECT CONDITIONS

A. Pre-Installation Conference: Convene a pre-installation conference just prior to commencement of field operations, to establish procedures to maintain optimum working conditions and to coordinate this work with related and adjacent work.

PART 2 PRODUCTS

2.1 MANUFACTURERS

A. Acceptable Manufacturer: Overhead Door Corp., 2501 S. State Hwy. 121, Suite 200, Lewisville, TX 75067. ASD. Tel. Toll Free: (800) 275-3290. Phone: (469) 549-7100. Fax: (972) 906-1499. Web Site: www.overheaddoor.com. E-mail: sales@overheaddoor.com.

B. Requests for substitutions will be considered in accordance with provisions of Section 016000.

2.2 GLAZED ALUMINUM SECTIONAL OVERHEAD DOORS

A. Glazed Sectional Overhead Doors: 521 Series Aluminum Doors by Overhead Door Corporation.
   1. Door Assembly: Stile and rail assembly secured with 1/4 inch (6 mm) diameter through rods.
      a. Panel Thickness: 1-3/4 inches (44 mm).
      b. Center Stile Width: 2-11/16 inches (68 mm)
      c. End Stile Width: 3-5/16 inches (84 mm) - 2 Per End
      d. Intermediate Rail Pair Width: 3-11/16 inches (94 mm).
      e. Top Rail Width:
         1) 3-3/4 inches (95 mm).
      f. Bottom Rail Width:
         1) 4-1/2 inches (114 mm).
      g. Aluminum Panels: 0.050 inch (1.3 mm) thick, aluminum.
      h. Stiles and Rails: 6063 - T6 aluminum.
      i. Glazing:
         1) 1/2 inch (12.5 mm) Tempered Insulating glass.
   2. Finish and Color:
      a. Anodized Finish: Clear anodized.
   3. Windload Design: Provide to meet the Design/Performance requirements specified.
   4. Hardware: Galvanized steel hinges and fixtures. Precision bearing rollers with hardened steel races.
   5. Lock:
      a. Interior galvanized single unit with interlock.
   6. Weatherstripping:
      a. Flexible bulb-type strip at bottom section.
      b. Flexible Jamb seals.
      c. Flexible Header seal.
   7. Track: Provide track as recommended by manufacturer to suit loading required and clearances available.
   8. Motor: Direct drive, integrated gear motor/brake assembly sized for openings. Provide with a manual hand chain for operation during power outages. Operator and drive assembly is provided with all wiring harnesses needed direct from the factory
      a. Entrapment Protection: Required for momentary contact or,radio control operation.
         1) Photoelectric sensors that cast an invisible beam across the door opening and reverses the downward motion of the door when an object enters the path of the beam.
      b. Operator Controls:
         1) Push-button and key operated control stations with open, close, and stop buttons.
         2) Surface mounting.
         3) Both interior and exterior location
      c. Special Operation:
         1) Vehicle detector operation.
         2) Radio control operation.
         3) Door timer operation.

PART 3 EXECUTION

3.1 EXAMINATION

A. Do not begin installation until openings have been properly prepared.

B. Verify wall openings are ready to receive work and opening dimensions and tolerances are within specified limits.

C. Verify electric power is available and of correct characteristics.

D. If preparation is the responsibility of another installer, notify Architect of unsatisfactory preparation before proceeding.

3.2 PREPARATION

A. Clean surfaces thoroughly prior to installation.

B. Prepare surfaces using the methods recommended by the manufacturer for achieving the best result for the substrate under the project conditions.

3.3 INSTALLATION

A. Install overhead doors and track in accordance with approved shop drawings and the manufacturer’s printed instructions.

B. Coordinate installation with adjacent work to ensure proper clearances and allow for maintenance.

C. Anchor assembly to wall construction and building framing without distortion or stress.

D. Securely brace door tracks suspended from structure. Secure tracks to structural members only.

E. Fit and align door assembly including hardware.

F. Coordinate installation of electrical service. Complete power and control wiring from disconnect to unit components.

3.4 CLEANING AND ADJUSTING

A. Adjust door assembly to smooth operation and in full contact with weatherstripping.

B. Clean doors, frames and glass.

C. Remove temporary labels and visible markings.

3.5 PROTECTION

A. Do not permit construction traffic through overhead door openings after adjustment and cleaning.

B. Protect installed products until completion of project.

C. Touch-up, damaged coatings and finishes and repair minor damage before Substantial Completion.

END OF SECTION

PART 1 GENERAL

1.01 SCOPE OF WORK

A. Furnishing of and paying for all labor, materials, services, appliances and equipment necessary for execution, installation and completion of all work specified herein and as shown on drawings.

B. Section includes:
1. Storefront type framing systems.
2. Aluminum storefront entrance doors and frames, complete with hardware (less cylinders).
3. Aluminum framing system storefront type windows, closure members, sidelight frames.
4. Aluminum grid frames, closure members and mullions.
5. Transition members connecting components, adapters, mountings and molds as required for a complete installation of the systems specified herein.
6. Glazing, glazing beads, trim, aluminum receptors, sills, gaskets, components, adapters, mountings, molds and anchors as required for and integral to the complete installation of all storefront framing systems specified herein.
7. Fins, anchors, shims, steel and aluminum structural internal support members, furring and other devices as may be required for full and complete watertight and structural mounting on these windows and their associated frames.

1.02 REFERENCES

A. American Society for Testing Materials (ASTM)
1. B221 - Specification for Aluminum Alloy Extruded Bar, Rod, Wire, Shape and Tube
2. D523 - Specular Gloss
3. E283 - Test Method for Rate of Air Leakage Through Exterior Windows, Curtain Walls and Doors
4. E330 - Structural Performance of Exterior Windows, Curtain Walls, and Doors by Uniform Static Air Pressure Difference
5. E331 - Test Method for Water Penetration of Exterior Windows, Curtain Walls, and Doors by Uniform Static Air Pressure Difference

1.03 PERFORMANCE REQUIREMENTS

A. Entrance Doors: Air infiltration shall be tested in accordance with ASTM E283, at a pressure differential of 1.567 psf (75 Pa). A single 3’-0” by 7’-0” entrance door and frame shall not exceed .50 CFM per linear foot of perimeter crack. A pair of 6’-0” by 7’-0” entrance doors and frame shall not exceed 1.0 CFM per linear foot of perimeter crack.

B. TRIFAB 451 Framing System:
1. Air infiltration shall be tested in accordance with ASTM E283. Infiltration shall not exceed .06 CFM per sq. ft. (.0003m_/s-m²) of fixed area.
2. Water infiltration shall be tested in accordance with ASTM E331. No water penetration at a test pressure of 6.24 psf (300 Pa.).
3. When tested in accordance with ASTM E330, the maximum deflection of any member shall not exceed 1/175 of its span and when the load is removed there shall be no evidence of permanent deformation or damage when tested under a load of 25.0 psf.

1.04 SUBMITTALS

A. Submit under provisions of Section 01 3000.

B. Shop Drawings: Shall be at full scale as far as practical and shall show in detail the construction of all parts of this work, including all field dimensions, metal and glass type, thicknesses, door hardware requirements, methods of joining, details of all field connections and anchorage, fastening, joint packing, caulking, methods and locations of all sealants, metal finishes, and all locations of all sealants, internal drainage system, and all other information pertinent to demonstrating compliance with Specifications.

C. Product Data: Provide component dimensions; describe components within assembly, anchorage and fasteners, glass and infill, door hardware, and caulking.

D. Samples: Submit two samples 4 inches by 6 inches in size illustrating prefinished aluminum surface.

1.05 PROJECT RECORD DOCUMENTS

A. Submit under provisions of Section 01 7200.

B. Submittals

1.06 PROJECT WARRANTIES, OPERATION AND MAINTENANCE DATA

A. Submit under provisions of Section 01 7250.

B. Warranties

1.07 DELIVERY, STORAGE AND HANDLING

A. Deliver, store, protect, and handle products to site under provisions of Section 01 6000.

1.08 WARRANTY

A. Aluminum Storefront System items will remain free against failure of material and workmanship to include excessive leakage, excessive deflections, deterioration of metal anodized finish systems in excess of normal weathering for minimum period of two years. Warranty to be non-prorated and to repair or replace any parts or material that do not withstand normal use.

B. Warranties to begin at the date of project Certificate of Substantial Completion.

PART 2 - PRODUCTS

2.01 MANUFACTURERS

A. Kawneer Company, Inc.
   1. Entrance Doors: Series 350 Swing Door
   2. Exterior Storefront Window Framing System: Tri-Fab 451 Framing System

B. Substitution: Under provisions of Section 01 6000.

2.02 MATERIALS

A. Extruded Aluminum: ASTM B221; 6063-T5 Alloy and Temper

B. Fasteners: ASTM A164; stainless steel or plated steel.

2.03 COMPONENTS

A. Doors (Kawneer Series 350 Heavy Wall):
   1. Frame: 1-3/4 inch thick, medium stile frame,conforming to handicap code requirements.
   2. Weather stripping: Kawneer sealer weathering, thermoplastic elastomer in a tubular shape with semi-rigid polymeric backing. Door bottom rail to be weathered with EPDM blade gasket sweep strip applied with concealed fasteners.

B. Frames (Kawneer Tri-Fab 451 Thermal):
   1. 2 inch by 6 inch nominal dimension; flush glazing with no projecting stops for inside or outside glazing (where shown on drawings) and 4 inch base frame where shown on Drawings.
   2. The system shall provide fully resilient settings for glass and panels by use of bulb type elastomeric gaskets on both sides of the glass. Adapters and mountings for trim moldings and face materials shall be designed so as to permit the installation of these products in their regular manner, and shall not interfere with the normal assembly and weathering of the grid framing. Framing system must retain glass in accord with requirements of the glass manufacturer, including applicable weeping systems of the complete assembly to the exterior.

C. Flashing: As specified under Section 07 6500.

2.04 GLASS AND GLAZING

A. As specified in Section 08 8000.

2.05 SEALANT MATERIAL

A. As specified in Section 07 9200.

2.06 DOOR HARDWARE

A. Hardware for the aluminum doors shall be furnished by the entrance manufacturer. Where practical, all hardware fittings shall be installed at the factory before shipment is made. Hardware shall be the entrance manufacturer's standard as follows:
   1. Hinges: Continuous Hinges.
   2. Locks: Adams Rite MS-1890 Deadlock/Latch Combination.
   3. Cylinder: Furnish under Section 08 7100.
   4. Closer: Furnish under Section 08 7100.
   5. Lever: 4560 lever handle.
   6. Threshold: Furnish under Section 08 7100.
   7. Pull: Kawneer Style C015.

2.07 FABRICATION

A. Entrance Doors:
   1. Doors shall be fabricated complete by the entrance manufacturer including the application of, or the preparation for, all operating hardware.

2. Corner construction shall consist of mechanical clip fastening, SIGMA deep penetration and fillet welds. Glazing stops shall be snap-in type with glazing gaskets.
3. Mortised hardware shall be fitted flush with finished trim moldings and applied directly to recessed sidewalls of the door and/or frame tubing. Cut-outs in door or frame moldings shall not require separate screw-applied tabs or straps on which to mount hinging hardware. Where shims and spacers are required for finished appearance, they shall provide full and solid bearing for the hardware.

B. Storefront Framing System (Kawneer Tri-Fab 451 Windows):
1. Fabricate components with minimum clearances and shim spacing around perimeter of assembly, yet enabling installation and dynamic movement of perimeter seal.
2. Accurately fit and secure joints and corners. Make joints flush, hairline, and weatherproof.
3. Prepare components to receive anchor devices. Fabricate anchors.
4. Arrange fasteners and attachments to conceal from view.
5. Prepare components with internal reinforcement for door hardware.
6. Provide aluminum subsill matching system finish.

2.08 FINISHES

A. AA – M12C22A41 Clear #14

2.09 SOURCE QUALITY CONTROL

A. Source Quality: Provide aluminum storefront specified herein from a single source.
1. Building Enclosure System: When aluminum storefront is part of a building enclosure system, including entrances, entrance hardware, windows, storefront framing and related products, provide building enclosure system products from a single source manufacturer.

PART 3 - EXECUTION

3.01 EXAMINATION

A. Verify site opening conditions under provisions of Section 01 3900.

B. Verify dimensions, tolerances, and method of attachment with other work.

C. Verify wall openings and adjoining air and vapor seal materials are ready to receive work of this Section.

D. Beginning of installation means acceptance of existing conditions.

3.02 INSTALLATION

A. Install frames and glazing in accordance with manufacturer's instructions.

B. Attach to structure to permit sufficient adjustment to accommodate construction tolerances and other irregularities.

C. Provide alignment attachments and shims to permanently fasten system to building structure.

D. Align assembly plumb and level, free of warp or twist. Maintain assembly dimensional tolerances, aligning with adjacent work.

E. Coordinate attachment and seal of air and vapor barrier materials.

F. Install aluminum subsill.

G. Pack fibrous insulation in shim spaces at perimeter of assembly to maintain continuity of thermal barrier.

H. Install glass in accordance with Section 08 8000.

I. Install perimeter caulking type sealant, backing materials, and installation requirements in accordance with Section 07 9200.

3.03 TOLERANCES

A. Variation from Plane: 0.03 inches per foot or 0.25 inches per 30 feet, whichever is less.

B. Misalignment of Two Adjoining Members Abutting in Plane: 0.015 inches.

3.04 CLEANING

A. Wash down exposed surfaces using a solution of mild household detergent in warm water, applied with soft, clean wiping cloths. Take care to remove dirt from corners. Wipe surfaces clean. Do not use other material or abrasive pads. Clean all glass surfaces, inside and out.

B. Remove excess sealant by moderate use of mineral spirits or other solvent acceptable to sealant manufacturer.

C. Leave work area clean and free of debris.

3.05 PROTECTION OF FINISHED WORK

A. Protect finished work under provisions of Section 01 5000.

END OF SECTION

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. This Section includes commercial door hardware for the following:

1. Swinging doors.
2. Other doors to the extent indicated.

B. Door hardware includes, but is not necessarily limited to, the following:

1. Mechanical door hardware.
2. Cylinders specified for doors in other sections.

C. Related Sections:

1. Division 08 Section “Door Hardware Schedule”.
2. Division 08 Section “Hollow Metal Doors and Frames”.
3. Division 08 Section “Flush Wood Doors”.

D. Codes and References: Comply with the version year adopted by the Authority Having Jurisdiction.

1. ANSI A117.1 - Accessible and Usable Buildings and Facilities.
2. ICC/IBC - International Building Code.
3. NFPA 70 - National Electrical Code.
4. NFPA 80 - Fire Doors and Windows.
5. NFPA 101 - Life Safety Code.
6. NFPA 105 - Installation of Smoke Door Assemblies.
7. State Building Codes, Local Amendments.

E. Standards: All hardware specified herein shall comply with the following industry standards:

1. ANSI/BHMA Certified Product Standards - A156 Series
2. UL10C – Positive Pressure Fire Tests of Door Assemblies

1.3 SUBMITTALS

A. Product Data: Manufacturer's product data sheets including installation details, material descriptions, dimensions of individual components and profiles, operational descriptions and finishes.

B. Door Hardware Schedule: Prepared by or under the supervision of supplier, detailing fabrication and assembly of door hardware, as well as procedures and diagrams. Coordinate the final Door

Hardware Schedule with doors, frames, and related work to ensure proper size, thickness, hand, function, and finish of door hardware.

1. Format: Comply with scheduling sequence and vertical format in DHI's "Sequence and Format for the Hardware Schedule."

2. Organization: Organize the Door Hardware Schedule into door hardware sets indicating complete designations of every item required for each door or opening. Organize door hardware sets in same order as in the Door Hardware Sets at the end of Part 3. Submittals that do not follow the same format and order as the Door Hardware Sets will be rejected and subject to resubmission.

3. Content: Include the following information:

    a. Type, style, function, size, label, hand, and finish of each door hardware item.
    b. Manufacturer of each item.
    c. Fastenings and other pertinent information.
    d. Location of door hardware set, cross-referenced to Drawings, both on floor plans and in door and frame schedule.
    e. Explanation of abbreviations, symbols, and codes contained in schedule.
    f. Mounting locations for door hardware.
    g. Door and frame sizes and materials.
    h. Warranty information for each product.

4. Submittal Sequence: Submit the final Door Hardware Schedule at earliest possible date, particularly where approval of the Door Hardware Schedule must precede fabrication of other work that is critical in the Project construction schedule. Include Product Data, Samples, Shop Drawings of other work affected by door hardware, and other information essential to the coordinated review of the Door Hardware Schedule.

C. Keying Schedule: After a keying meeting with the owner has taken place prepare a separate keying schedule detailing final instructions. Submit the keying schedule in electronic format. Include keying system explanation, door numbers, key set symbols, hardware set numbers and special instructions. Owner must approve submitted keying schedule prior to the ordering of permanent cylinders/cores.

D. Informational Submittals:

1. Product Test Reports: Indicating compliance with cycle testing requirements, based on evaluation of comprehensive tests performed by manufacturer and witnessed by a qualified independent testing agency.

E. Operating and Maintenance Manuals: Provide manufacturers operating and maintenance manuals for each item comprising the complete door hardware installation in quantity as required in Division 01, Closeout Submittals.

1.4 QUALITY ASSURANCE

A. Manufacturers Qualifications: Engage qualified manufacturers with a minimum 5 years of documented experience in producing hardware and equipment similar to that indicated for this Project and that have a proven record of successful in-service performance.

B. Installer Qualifications: A minimum 3 years documented experience installing both standard and electrified door hardware similar in material, design, and extent to that indicated for this Project and whose work has resulted in construction with a record of successful in-service performance.

C. Door Hardware Supplier Qualifications: Experienced commercial door hardware distributors with a minimum 5 years documented experience supplying both mechanical and electromechanical hardware installations comparable in material, design, and extent to that indicated for this Project. Supplier recognized as a factory direct distributor by the manufacturers of the primary materials with a warehousing facility in Project's vicinity. Supplier to have on staff a certified Architectural Hardware Consultant (AHC) available during the course of the Work to consult with Contractor, Architect, and Owner concerning both standard and electromechanical door hardware and keying.

D. Source Limitations: Obtain each type and variety of door hardware specified in this section from a single source unless otherwise indicated.

E. Each unit to bear third party permanent label demonstrating compliance with the referenced standards.

F. Keying Conference: Conduct conference to comply with requirements in Division 01 Section "Project Meetings." Keying conference to incorporate the following criteria into the final keying schedule document:

1. Function of building, purpose of each area and degree of security required.
2. Plans for existing and future key system expansion.
3. Requirements for key control storage and software.
4. Installation of permanent keys, cylinder cores and software.
5. Address and requirements for delivery of keys.

G. Pre-Submittal Conference: Conduct coordination conference in compliance with requirements in Division 01 Section "Project Meetings" with attendance by representatives of Supplier(s), Installer(s), and Contractor(s) to review proper methods and the procedures for receiving, handling, and installing door hardware.

1. Prior to installation of door hardware, conduct a project specific training meeting to instruct the installing contractors' personnel on the proper installation and adjustment of their respective products. Product training to be attended by installers of door hardware (including electromechanical hardware) for aluminum, hollow metal and wood doors. Training will include the use of installation manuals, hardware schedules, templates and physical product samples as required.
2. Inspect and discuss electrical roughing-in, power supply connections, and other preparatory work performed by other trades.
3. Review sequence of operation narratives for each unique access controlled opening.
4. Review and finalize construction schedule and verify availability of materials.
5. Review the required inspecting, testing, commissioning, and demonstration procedures

H. At completion of installation, provide written documentation that components were applied to manufacturer's instructions and recommendations and according to approved schedule.

1.5 DELIVERY, STORAGE, AND HANDLING

A. Inventory door hardware on receipt and provide secure lock-up and shelving for door hardware delivered to Project site. Do not store electronic access control hardware, software or accessories at Project site without prior authorization.

B. Tag each item or package separately with identification related to the final Door Hardware Schedule, and include basic installation instructions with each item or package.

C. Deliver, as applicable, permanent keys, cylinders, cores, access control credentials, software and related accessories directly to Owner via registered mail or overnight package service. Instructions for delivery to the Owner shall be established at the "Keying Conference".

1.6 COORDINATION

A. Templates: Obtain and distribute to the parties involved templates for doors, frames, and other work specified to be factory prepared for installing standard and electrified hardware. Check Shop Drawings of other work to confirm that adequate provisions are made for locating and installing hardware to comply with indicated requirements.

B. Door and Frame Preparation: Doors and corresponding frames are to be prepared, reinforced and pre-wired (if applicable) to receive the installation of the specified electrified, monitoring, signaling and access control system hardware without additional in-field modifications.

1.7 WARRANTY

A. General Warranty: Reference Division 01, General Requirements. Special warranties specified in this Article shall not deprive Owner of other rights Owner may have under other provisions of the Contract Documents and shall be in addition to, and run concurrent with, other warranties made by Contractor under requirements of the Contract Documents.

B. Warranty Period: Written warranty, executed by manufacturer(s), agreeing to repair or replace components of standard and electrified door hardware that fails in materials or workmanship within specified warranty period after final acceptance by the Owner. Failures include, but are not limited to, the following:

1. Structural failures including excessive deflection, cracking, or breakage.
2. Faulty operation of the hardware.
3. Deterioration of metals, metal finishes, and other materials beyond normal weathering.
4. Electrical component defects and failures within the systems operation.

C. Standard Warranty Period: One year from date of Substantial Completion, unless otherwise indicated.

D. Special Warranty Periods:
1. Five years for standard duty cylindrical (bored) locks and latches.
2. Twenty five years for manual surface door closer bodies.

1.8 MAINTENANCE SERVICE

A. Maintenance Tools and Instructions: Furnish a complete set of specialized tools and maintenance instructions as needed for Owner's continued adjustment, maintenance, and removal and replacement of door hardware.

PART 2 - PRODUCTS

2.1 SCHEDULED DOOR HARDWARE

A. General: Provide door hardware for each door to comply with requirements in Door Hardware Sets and each referenced section that products are to be supplied under.

B. Designations: Requirements for quantity, item, size, finish or color, grade, function, and other distinctive qualities of each type of door hardware are indicated in the Door Hardware Sets at the end of Part 3. Products are identified by using door hardware designations, as follows:

C. Named Manufacturer's Products: Product designation and manufacturer are listed for each door hardware type required for the purpose of establishing requirements. Manufacturers' names are abbreviated in the Door Hardware Schedule.

D. Substitutions: Requests for substitution and product approval for inclusive mechanical and electromechanical door hardware in compliance with the specifications must be submitted in writing and in accordance with the procedures and time frames outlined in Division 01, Substitution Procedures. Approval of requests is at the discretion of the architect, owner, and their designated consultants.

2.2 HANGING DEVICES

A. Hinges: ANSI/BHMA A156.1 certified butt hinges with number of hinge knuckles as specified in the Door Hardware Sets.

1. Quantity: Provide the following hinge quantity, unless otherwise indicated:

    a. Two Hinges: For doors with heights up to 60 inches.
    b. Three Hinges: For doors with heights 61 to 90 inches.
    c. Four Hinges: For doors with heights 91 to 120 inches.
    d. For doors with heights more than 120 inches, provide 4 hinges, plus 1 hinge for every 30 inches of door height greater than 120 inches.

2. Hinge Size: Provide the following, unless otherwise indicated, with hinge widths sized for door thickness and clearances required:

    a. Widths up to 3’0”: 4-1/2” standard or heavy weight as specified.
    b. Sizes from 3’1” to 4’0”: 5” standard or heavy weight as specified.

3. Hinge Weight and Base Material: Unless otherwise indicated, provide the following:

a. Exterior Doors: Heavy weight, non-ferrous, ball bearing or oil impregnated bearing hinges unless Hardware Sets indicate standard weight.
b. Interior Doors: Standard weight, steel, ball bearing or oil impregnated bearing hinges unless Hardware Sets indicate heavy weight.

4. Hinge Options: Comply with the following where indicated in the Hardware Sets or on Drawings:

a. Non-removable Pins: Provide set screw in hinge barrel that, when tightened into a groove in hinge pin, prevents removal of pin while door is closed; for the all out-swinging lockable doors.

5. Acceptable Manufacturers:

a. Ives (IVE)
b. Hager Companies (HAG).
c. McKinney Products (MCK).

B. Continuous Geared Hinges: ANSI/BHMA A156.26 Grade 1-600 certified continuous geared hinge. with minimum 0.120-inch thick extruded 6060 T6 aluminum alloy hinge leaves and a minimum overall width of 4 inches. Hinges are non-handed, reversible and fabricated to template screw locations. Factory trim hinges to suit door height and prepare for electrical cut-outs.

1. Acceptable Manufacturers:

a. Ives (IVE)
b. Hager Companies (HAG).
c. McKinney Products (MCK).

2.3 DOOR OPERATING TRIM

A. Flush Bolts and Surface Bolts: ANSI/BHMA A156.3 and A156.16, Grade 1, certified.

1. Flush bolts to be furnished with top rod of sufficient length to allow bolt retraction device location approximately six feet from the floor.
2. Furnish dust proof strikes for bottom bolts.
3. Surface bolts to be minimum 8” in length and U.L. listed for labeled fire doors and U.L. listed for windstorm components where applicable.
4. Provide related accessories (mounting brackets, strikes, coordinators, etc.) as required for appropriate installation and operation.

5. Acceptable Manufacturers:

a. Ives (IVE).
b. Rockwood Manufacturing (ROC).
c. Trimco (TRI).

B. Door Push Plates and Pulls: ANSI/BHMA A156.6 certified door pushes and pulls of type and design specified in the Hardware Sets. Coordinate and provide proper width and height as required where conflicting hardware dictates.

1. Push/Pull Plates: Minimum .050 inch thick, size as indicated in hardware sets, with beveled edges, secured with exposed screws unless otherwise indicated.
2. Door Pull and Push Bar Design: Size, shape, and material as indicated in the hardware sets. Minimum clearance of 2 1/2-inches from face of door unless otherwise indicated.
3. Offset Pull Design: Size, shape, and material as indicated in the hardware sets. Minimum clearance of 2 1/2-inches from face of door and offset of 90 degrees unless otherwise indicated.
4. Fasteners: Provide manufacturer's designated fastener type as indicated in Hardware Sets.

5. Acceptable Manufacturers:

    a. Ives (IVE).
    b. Rockwood Manufacturing (ROC).
    c. Trimco (TRI).

2.4 CYLINDERS AND KEYING

A. General: Cylinder manufacturer to have minimum (10) years experience designing secured master key systems and have on record a published security keying system policy.

B. Source Limitations: Obtain each type of keyed cylinder and keys from the same source manufacturer as locksets and exit devices, unless otherwise indicated.

1. Acceptable Manufacturers:

    a. Schlage (SCH).
    b. Sargent Manufacturing (SAR).

C. Cylinders: Original manufacturer cylinders complying with the following:

1. Mortise Type: Threaded cylinders with rings and cams to suit hardware application.
2. Rim Type: Cylinders with back plate, flat-type vertical or horizontal tailpiece, and raised trim ring.
3. Bored-Lock Type: Cylinders with tailpieces to suit locks.
4. Mortise and rim cylinder collars to be solid and recessed to allow the cylinder face to be flush and be free spinning with matching finishes.
5. Keyway: Manufacturer’s Standard.

D. Keying System: Each type of lock and cylinders to be factory keyed.

1. Conduct specified "Keying Conference" to define and document keying system instructions and requirements.
2. Furnish factory cut, nickel-silver large bow permanently inscribed with a visual key control number as directed by Owner.
3. New System: Key locks to a new key system as directed by the Owner.

E. Key Quantity: Provide the following minimum number of keys:

1. Change Keys per Cylinder: Two (2)
2. Master Keys (per Master Key Level/Group): Five (5).
3. Construction Keys (where required): Ten (10).

F. Construction Keying: Provide construction master keyed cylinders.

G. Key Registration List (Bitting List):

1. Provide keying transcript list to Owner's representative in the proper format for importing into key control software.
2. Provide transcript list in writing or electronic file as directed by the Owner.

H. Key Control Cabinet: Provide a key control system including envelopes, labels, and tags with self-locking key clips, receipt forms, 3-way visible card index, temporary markers, permanent markers, and standard metal cabinet. Key control cabinet shall have expansion capacity of 150% of the number of locks required for the project.

1. Acceptable Manufacturers:

a. Lund Equipment (LU).
b. MMF Industries (MM).
c. Telkee (TK).

2.5 MECHANICAL LOCKS AND LATCHING DEVICES

A. Cylindrical Locksets, Grade 1 (Heavy Duty): ANSI/BHMA A156.2, Series 4000, Grade 1 certified.

1. Locks are to be non-handed and fully field reversible.

2. Acceptable Manufacturers:

a. Schlage (SCH) – ND Series
b. Sargent Manufacturing (SA) - 11-Line.

2.6 AUXILIARY LOCKS

A. Narrow Case Deadlocks and Deadlatches: ANSI/BHMA 156.13 Series 1000 Grade 1 certified narrow case deadlocks and deadlatches for swinging or sliding door applications. All functions shall be manufactured in a single sized case formed from 12 gauge minimum, corrosion resistant steel (option for fully stainless steel case and components). Provide minimum 2 7/8" throw laminated stainless steel bolt. Bottom rail deadlocks to have 3/8” diameter bolts.

1. Acceptable Manufacturers:

a. Adams Rite Manufacturing (AD) - MS1850S / MS1950 Series.

2.7 LOCK AND LATCH STRIKES

A. Strikes: Provide manufacturer's standard strike with strike box for each latch or lock bolt, with curved lip extended to protect frame, finished to match door hardware set, unless otherwise indicated, and as follows:

1. Flat-Lip Strikes: For locks with three-piece antifriction latchbolts, as recommended by manufacturer.
2. Extra-Long-Lip Strikes: For locks used on frames with applied wood casing trim.
3. Aluminum-Frame Strike Box: Provide manufacturer's special strike box fabricated for aluminum framing.
4. Double-lipped strikes: For locks at double acting doors. Furnish with retractable stop for rescue hardware applications.

B. Standards: Comply with the following:

1. Strikes for Mortise Locks and Latches: BHMA A156.13.
2. Strikes for Bored Locks and Latches: BHMA A156.2.
3. Strikes for Auxiliary Deadlocks: BHMA A156.36.
4. Dustproof Strikes: BHMA A156.16.

2.8 CONVENTIONAL EXIT DEVICES

A. General Requirements: All exit devices specified herein shall meet or exceed the following criteria:

1. At doors not requiring a fire rating, provide devices complying with NFPA 101 and listed and labeled for "Panic Hardware" according to UL305. Provide proper fasteners as required by manufacturer including sex nuts and bolts at openings specified in the Hardware Sets.

2. Where exit devices are required on fire rated doors, provide devices complying with NFPA 80 and with UL labeling indicating "Fire Exit Hardware". Provide devices with the proper fasteners for installation as tested and listed by UL. Consult manufacturer’s catalog and template book for specific requirements.

3. Except on fire rated doors, provide exit devices with hex key dogging device to hold the pushbar and latch in a retracted position. Provide optional keyed cylinder dogging on devices where specified in Hardware Sets.

4. Devices must fit flat against the door face with no gap that permits unauthorized dogging of the push bar. The addition of filler strips is required in any case where the door light extends behind the device as in a full glass configuration.

5. Lever Operating Trim: Where exit devices require lever trim, furnish manufacturer's heavy duty escutcheon trim with threaded studs for thru-bolts.

    a. Lock Trim Design: As indicated in Hardware Sets, provide finishes and designs to match that of the specified locksets.
    b. Where function of exit device requires a cylinder, provide a cylinder (Rim or Mortise) as specified in Hardware Sets.

6. Vertical Rod Exit Devices: Where surface or concealed vertical rod exit devices are used at interior openings, provide as less bottom rod (LBR) unless otherwise indicated. Provide dust proof strikes where thermal pins are required to project into the floor.

7. Narrow Stile Applications: At doors constructed with narrow stiles, or as specified in Hardware Sets, provide devices designed for maximum 2” wide stiles.

8. Dummy Push Bar: Nonfunctioning push bar matching functional push bar.

9. Rail Sizing: Provide exit device rails factory sized for proper door width application.

10. Through Bolt Installation: For exit devices and trim as indicated in Door Hardware Sets.

B. Conventional Push Rail Exit Devices (Commercial Duty): ANSI/BHMA A156.3, Grade 1 certified panic and fire exit hardware devices furnished in the functions specified in the Hardware Sets. Fabricate latchbolts from cast stainless steel, Pullman type, incorporating a deadlocking feature.

1. Acceptable Manufacturers:

a. Von Duprin (VON) 35/98 Series
b. Sargent (SAR) 19-43-GL-80 Series

2.9 DOOR CLOSERS

A. All door closers specified herein shall meet or exceed the following criteria:

1. General: Door closers to be from one manufacturer, matching in design and style, with the same type door preparations and templates regardless of application or spring size. Closers to be non-handed with full sized covers including installation and adjusting information on inside of cover.

2. Standards: Closers to comply with UL-10C for Positive Pressure Fire Test and be U.L. listed for use of fire rated doors.

3. Cycle Testing: Provide closers which have surpassed 15 million cycles in a test witnessed and verified by UL.

4. Size of Units: Comply with manufacturer's written recommendations for sizing of door closers depending on size of door, exposure to weather, and anticipated frequency of use. Where closers are indicated for doors required to be accessible to the physically handicapped, provide units complying with ANSI ICC/A117.1.

5. Closer Arms: Provide heavy duty, forged steel closer arms unless otherwise indicated in Hardware Sets.

6. Closers shall not be installed on exterior or corridor side of doors; where possible install closers on door for optimum aesthetics.

7. Closer Accessories: Provide door closer accessories including custom templates, special mounting brackets, spacers and drop plates as required for proper installation. Provide through-bolt and security type fasteners as specified in the hardware sets.

B. Door Closers, Surface Mounted (Standard Duty): ANSI/BHMA 156.4, Grade 1 certified surface mounted, institutional grade door closers with complete spring power adjustment, sizes 1 thru 6; and fully operational adjustable according to door size, frequency of use, and opening force. Closers to be rack and pinion type, one piece cast iron or aluminum alloy body construction, with adjustable backcheck, closing sweep, and latch speed control valves. Provide non-handed units standard.

1. Acceptable Manufacturers:

    a. LCN (LCN) – 4010/4110 Series.
    b. Sargent Manufacturing (SAR) - 281 Series.

2.10 ARCHITECTURAL TRIM

A. Door Protective Trim

1. General: Door protective trim units to be of type and design as specified below or in the Hardware Sets.

2. Size: Fabricate protection plates (kick, armor, or mop) not more than 2" less than door width (LDW) on stop side of single doors and 1” LDW on stop side of pairs of doors, and not more than 1" less than door width on pull side. Coordinate and provide proper width and height as required where conflicting hardware dictates. Height to be as specified in the Hardware Sets.

3. Where plates are applied to fire rated doors with the top of the plate more than 16” above the bottom of the door, provide plates complying with NFPA 80. Consult manufacturer’s catalog and template book for specific requirements for size and applications.

4. Protection Plates: ANSI/BHMA A156.6 certified protection plates (kick, armor, or mop), fabricated from the following:

    a. Stainless Steel: 300 grade, 050-inch thick.

5. Options and fasteners: Provide manufacturer's designated fastener type as specified in the Hardware Sets. Provide countersunk screw holes.

6. Acceptable Manufacturers:

    a. Ives (IVE).
    b. Rockwood Manufacturing (RO).
    c. Trimco (TC).

2.11 DOOR STOPS AND HOLDERS

A. General: Door stops and holders to be of type and design as specified below or in the Hardware Sets.

B. Door Stops and Bumpers: ANSI/BHMA A156.16, Grade 1 certified door stops and wall bumpers. Provide wall bumpers, either convex or concave types with anchorage as indicated, unless floor or other types of door stops are specified in Hardware Sets. Do not mount floor stops where they will impede traffic. Where floor or wall bumpers are not appropriate, provide overhead type stops and holders.

1. Acceptable Manufacturers:

    a. IVE (IVE).
    b. Rockwood Manufacturing (ROC).

c. Trimco (TRI).

C. Overhead Door Stops and Holders: ANSI/BHMA A156.6, Grade 1 certified overhead stops and holders to be surface or concealed types as indicated in Hardware Sets. Track, slide, arm and jamb bracket to be constructed of extruded bronze and shock absorber spring of heavy tempered steel. Provide non-handed design with mounting brackets as required for proper operation and function.

1. Acceptable Manufacturers:

a. Glynn Johnson (GLY).
b. Rixson Door Controls (RIX).

2.12 ARCHITECTURAL SEALS

A. General: Thresholds, weatherstripping, and gasket seals to be of type and design as specified below or in the Hardware Sets. Provide continuous weatherstrip gasketing on exterior doors and provide smoke, light, or sound gasketing on interior doors where indicated. At exterior applications provide non-corrosive fasteners and elsewhere where indicated.

B. Smoke Labeled Gasketing: Assemblies complying with NFPA 105 that are listed and labeled by a testing and inspecting agency acceptable to authorities having jurisdiction, for smoke control ratings indicated, based on testing according to UL 1784.

1. Provide smoke labeled perimeter gasketing at all smoke labeled openings.

C. Fire Labeled Gasketing: Assemblies complying with NFPA 80 that are listed and labeled by a testing and inspecting agency acceptable to authorities having jurisdiction, for fire ratings indicated, based on testing according to UL-10C.

1. Provide intumescent seals as indicated to meet UL10C Standard for Positive Pressure Fire Tests of Door Assemblies, and NPFA 252, Standard Methods of Fire Tests of Door Assemblies.

D. Sound-Rated Gasketing: Assemblies that are listed and labeled by a testing and inspecting agency, for sound ratings indicated.

E. Replaceable Seal Strips: Provide only those units where resilient or flexible seal strips are easily replaceable and readily available from stocks maintained by manufacturer.

F. Acceptable Manufacturers:

1. Zero (ZER)
2. National Guard Products (NGP).
3. Pemko Manufacturing (PE).

2.13 FABRICATION

A. Fasteners: Provide door hardware manufactured to comply with published templates generally prepared for machine, wood, and sheet metal screws. Provide screws according to manufacturers recognized installation standards for application intended.

2.14 FINISHES

A. Standard: Designations used in the Hardware Sets and elsewhere indicate hardware finishes complying with ANSI/BHMA A156.18, including coordination with traditional U.S. finishes indicated by certain manufacturers for their products.

B. Provide quality of finish, including thickness of plating or coating (if any), composition, hardness, and other qualities complying with manufacturer's standards, but in no case less than specified by referenced standards for the applicable units of hardware

C. Protect mechanical finishes on exposed surfaces from damage by applying a strippable, temporary protective covering before shipping.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine scheduled openings, with Installer present, for compliance with requirements for installation tolerances, labeled fire door assembly construction, wall and floor construction, and other conditions affecting performance.

B. Notify architect of any discrepancies or conflicts between the door schedule, door types, drawings and scheduled hardware. Proceed only after such discrepancies or conflicts have been resolved in writing.

3.2 PREPARATION

A. Hollow Metal Doors and Frames: Comply with ANSI/DHI A115 series.

B. Wood Doors: Comply with ANSI/DHI A115-W series.

3.3 INSTALLATION

A. Install each item of mechanical and electromechanical hardware and access control equipment to comply with manufacturer's written instructions and according to specifications.

1. Installers are to be trained and certified by the manufacturer on the proper installation and adjustment of fire, life safety, and security products including: hanging devices; locking devices; closing devices; and seals.

B. Mounting Heights: Mount door hardware units at heights indicated in following applicable publications, unless specifically indicated or required to comply with governing regulations:

1. Standard Steel Doors and Frames: DHI's "Recommended Locations for Architectural Hardware for Standard Steel Doors and Frames."
2. Wood Doors: DHI WDHS.3, "Recommended Locations for Architectural Hardware for Wood Flush Doors."
3. Where indicated to comply with accessibility requirements, comply with ANSI A117.1 "Accessibility Guidelines for Buildings and Facilities."

4. Provide blocking in drywall partitions where wall stops or other wall mounted hardware is located.

C. Retrofitting: Install door hardware to comply with manufacturer's published templates and written instructions. Where cutting and fitting are required to install door hardware onto or into surfaces that are later to be painted or finished in another way, coordinate removal, storage, and reinstallation of surface protective trim units with finishing work specified in Division 9 Sections. Do not install surface-mounted items until finishes have been completed on substrates involved.

D. Thresholds: Set thresholds for exterior and acoustical doors in full bed of sealant complying with requirements specified in Division 7 Section "Joint Sealants."

E. Storage: Provide a secure lock up for hardware delivered to the project but not yet installed. Control the handling and installation of hardware items so that the completion of the work will not be delayed by hardware losses before and after installation.

3.4 FIELD QUALITY CONTROL

A. Field Inspection: Supplier will perform a final inspection of installed door hardware and state in report whether work complies with or deviates from requirements, including whether door hardware is properly installed, operating and adjusted.

3.5 ADJUSTING

A. Initial Adjustment: Adjust and check each operating item of door hardware and each door to ensure proper operation or function of every unit. Replace units that cannot be adjusted to operate as intended. Adjust door control devices to compensate for final operation of heating and ventilating equipment and to comply with referenced accessibility requirements.

3.6 CLEANING AND PROTECTION

A. Protect all hardware stored on construction site in a covered and dry place. Protect exposed hardware installed on doors during the construction phase. Install any and all hardware at the latest possible time frame.

B. Clean adjacent surfaces soiled by door hardware installation.

C. Clean operating items as necessary to restore proper finish. Provide final protection and maintain conditions that ensure door hardware is without damage or deterioration at time of owner occupancy.

3.7 DEMONSTRATION

A. Instruct Owner's maintenance personnel to adjust, operate, and maintain mechanical and electromechanical door hardware.

3.8 DOOR HARDWARE SETS

A. The hardware sets represent the design intent and direction of the owner and architect. They are a guideline only and should not be considered a detailed hardware schedule. Discrepancies, conflicting hardware and missing items should be brought to the attention of the architect with corrections made prior to the bidding process. Omitted items not included in a hardware set should be scheduled with the appropriate additional hardware required for proper application and functionality.

HARDWARE GROUP NO. 001

FOR USE ON DOOR #(S):
G1

PROVIDE EACH SGL DOOR(S) WITH THE FOLLOWING:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR

-ALL HARDWARE BY OVERHEAD DOOR MANUFACTURER

HARDWARE GROUP NO. 002-EX

FOR USE ON DOOR #(S):
EX1

PROVIDE EACH SGL DOOR(S) WITH THE FOLLOWING:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
1	EA	PANIC HARDWARE	99-L-07	626	VON
1	EA	RIM CYLINDER	20-057 ICX W/KEYED CONST. CORE	626	SCH
1	EA	FSIC PERMANENT CORE	23-030	626	SCH

- INSTALL NEW PANIC HARDWARE ON EXISTING DOOR AND FRAME. BALANCE OF EXISTING HARDWARE TO REMAIN. GENERAL CONTRACTOR IS TO VERIFY IN FIELD THAT NEW HARDWARE CAN BE INSTALLED ON EXISTING DOOR AND FRAME. INSPECT ALL EXISTING HARDWARE FOR PROPER OPERATION. NOTIFY ARCHITECT IMMEDIATELY OF ANY INCOMPATIBILITY OR DEFICIENCY.

HARDWARE GROUP NO. 103

FOR USE ON DOOR #(S):
101

PROVIDE EACH SGL DOOR(S) WITH THE FOLLOWING:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
3	EA	HINGE	5BB1 4.5 X 4.5	652	IVE
1	EA	ENTRANCE/OFFICE LOCK	ND50TD ATH	626	SCH
1	EA	FSIC PERMANENT CORE	23-030	626	SCH
1	EA	WALL STOP	WS406/407CCV	630	IVE
3	EA	SILENCER	SR64	GRY	IVE

HARDWARE GROUP NO. 201C

FOR USE ON DOOR #(S):
104

PROVIDE EACH SGL DOOR(S) WITH THE FOLLOWING:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
3	EA	HINGE	5BB1 4.5 X 4.5 NRP	652	IVE
1	EA	STOREROOM LOCK	ND80TD ATH	626	SCH
1	EA	FSIC PERMANENT CORE	23-030	626	SCH
1	EA	SURFACE CLOSER	4111 SCUSH	689	LCN
1	EA	KICK PLATE	8400 10" X 2" LDW B-CS	630	IVE
1	EA	GASKETING	188S	BK	ZER

HARDWARE GROUP NO. 205

FOR USE ON DOOR #(S):
113

PROVIDE EACH SGL DOOR(S) WITH THE FOLLOWING:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
3	EA	HINGE	5BB1 4.5 X 4.5 NRP	630	IVE
1	EA	STOREROOM LOCK	ND80TD ATH	626	SCH
1	EA	FSIC PERMANENT CORE	23-030	626	SCH
1	EA	SURFACE CLOSER	4111 SCUSH	689	LCN
1	EA	KICK PLATE	8400 10" X 2" LDW B-CS	630	IVE
1	EA	RAIN DRIP	142AA DW + 4"	AA	ZER
1	EA	GASKETING	188S	BK	ZER
1	EA	DOOR SWEEP	39A	A	ZER
1	EA	THRESHOLD	655A	A	ZER

HARDWARE GROUP NO. 341C

FOR USE ON DOOR #(S):
106 107 120

PROVIDE EACH SGL DOOR(S) WITH THE FOLLOWING:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
3	EA	HINGE	5BB1 4.5 X 4.5	652	IVE
1	EA	PRIVACY W/DEADBOLT	L9440 07A 09-544 L283-722 (INDICATOR)	626	SCH
1	EA	SURFACE CLOSER	4111 SCUSH	689	LCN
1	EA	KICK PLATE	8400 10" X 2" LDW B-CS	630	IVE
1	EA	GASKETING	188S	BK	ZER

HARDWARE GROUP NO. 501R

FOR USE ON DOOR #(S):
103 109

PROVIDE EACH SGL DOOR(S) WITH THE FOLLOWING:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
3	EA	HINGE	5BB1 4.5 X 4.5	652	IVE
1	EA	CLASSROOM LOCK	ND70TD ATH	626	SCH
1	EA	FSIC PERMANENT CORE	23-030	626	SCH
1	EA	SURFACE CLOSER	4111 EDA	689	LCN
1	EA	KICK PLATE	8400 10" X 2" LDW B-CS	630	IVE
1	EA	WALL STOP	WS406/407CCV	630	IVE
1	EA	GASKETING	188S	BK	ZER

HARDWARE GROUP NO. 714A

FOR USE ON DOOR #(S):
100 110

PROVIDE EACH PR DOOR(S) WITH THE FOLLOWING:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
2	EA	CONT. HINGE	112XY EPT	628	IVE
2	EA	POWER TRANSFER	EPT10	689	VON
1	EA	PANIC HARDWARE	3547A-EO	626	VON
1	EA	PANIC HARDWARE	3547A-NL-OP	626	VON
1	EA	RIM CYLINDER	20-057 ICX W/KEYED CONST. CORE	626	SCH
1	EA	FSIC PERMANENT CORE	23-030	626	SCH
2	EA	90 DEG OFFSET PULL	8190HD 10" O	630	IVE
2	EA	SURFACE CLOSER	4111 SCUSH	689	LCN
2	EA	MOUNTING PLATE	4110-18	689	LCN
2	EA	CUSH SHOE SUPPORT	4110-30	689	LCN
2	EA	BLADE STOP SPACER	4110-61	689	LCN
1	SET	SEAL	PERIMETER SEAL BY FRAME MFR		
1	SET	ASTRAGAL	MEETING STILE SEAL BY DOOR MFR		
2	EA	DOOR SWEEP	39A	A	ZER
1	EA	THRESHOLD	655A	A	ZER

-PREPARE DOOR AND FRAME FOR FUTURE CARD READER. WHEN CARD READER IS ADDED A VON DUPRIN QEL BASEPLATE CONVERSION KIT WILL BE REQUIRED TO BE ADDED TO THE PANIC HARDWARE. PART NUMBER 958003. POWER SUPPLY PS902 900-2RS 900-BBK WILL ALSO BE REQUIRED.

HARDWARE GROUP NO. 781C

FOR USE ON DOOR #(S):
105

PROVIDE EACH SGL DOOR(S) WITH THE FOLLOWING:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
3	EA	HINGE	5BB1 4.5 X 4.5 NRP	652	IVE
1	EA	PANIC HARDWARE	LD-98-L-NL-07	626	VON
1	EA	RIM CYLINDER	20-057 ICX W/KEYED CONST. CORE	626	SCH
1	EA	FSIC PERMANENT CORE	23-030	626	SCH
1	EA	SURFACE CLOSER	4111 SCUSH	689	LCN
1	EA	KICK PLATE	8400 10" X 2" LDW B-CS	630	IVE
1	EA	GASKETING	188S	BK	ZER

HARDWARE GROUP NO. T141

FOR USE ON DOOR #(S):
119

PROVIDE EACH SGL DOOR(S) WITH THE FOLLOWING:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
3	EA	HINGE	5BB1HW 4.5 X 4.5	652	IVE
1	EA	OFFICE W/SIM RETRACT	LV9056T 07A 09-544 L283-712	626	SCH
1	EA	FSIC PERMANENT CORE	23-030	626	SCH
1	EA	SURFACE CLOSER	4011	689	LCN
1	EA	KICK PLATE	8400 10" X 2" LDW B-CS	630	IVE
1	EA	WALL STOP	WS406/407CCV	630	IVE
1	EA	GASKETING	188S	BK	ZER

-FOR USE WITH STEELCRAFT PALADIN DOOR ASSEMBLY.
-DOORS AND HARDWARE ARE SOLD AS A COMPLETE TESTED ASSEMBLY.

END OF SECTION

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Glass.

B. Frameless mirrors.

1.02 REFERENCES

A. 16 CFR 1201 – Safety Standard for Architectural Glazing Materials; current edition.

B. ANSI Z97.1 – American National Standard for Safety Glazing Materials Used in Building, Safety Performance Specifications and Methods of Test; 2004.

C. ASTM C 864 – Standard Specification for Dense Elastomeric Compression Seal Gaskets, Setting Blocks, and spacers; 1999 (Reapproved 2005).

D. ASTM C 1036 – Standard Specification for Flat Glass; 2001.

E. ASTM C 1048 – Standard Specification for Heat-Treated Flat Glass—Kind HS, Kind FT Coated and Uncoated Glass; 2004.

F. ASTM C 1993 – Standard Guide for Use of Joint Sealants; 2005.

G. ASTM E 773 – Standard Test Method for Accelerated weathering of Sealed Insulating Glass Units; 2001.

H. ASTM E 774 – Standard Specification for the Classification of the Durability of Sealed Insulating Glass Units; 1997.

I. ASTM E 1300 – Standard Practice for Determining Load Resistance of Glass in Buildings; 2004.

J. GANA (GM) – GANA Glazing Manual; Glass Association of North America; 2004.

K. GANA (SM) – FGMA Sealant Manual; Glass Association of North America; 1990.

L. SIGMA TM-3000 – Glazing Guidelines for Sealed Insulating Glass Units; Sealed Insulating Glass Manufacturers Association; 2004.

1.03 PERFORMANCE REQUIREMENTS

A. Select type and thickness of exterior glass to withstand dead loads and wind loads acting normal to plane of glass at design pressures calculated in accordance with ASCE 7 and applicable building codes.
   1. Use the procedure specified in ASTM E 1300 to determine glass type and thickness.
   2. Limit glass deflection to 1/200 or flexure limit of glass, whichever is less, with full recovery of glazing materials.
   3. Thicknesses listed are minimum.

B. Provide tempered glass at hazardous locations as indicated below and where shown on the drawings. Substitute fully tempered glass where drawings indicate annealed or heat strengthened glass in hazardous locations.
   1. Provide Fully Tempered Glass at all hazardous locations as defined by the International Building Code, 2006 Edition and as indicated below.
   2. Glass areas greater than 9 sf that are located less than 18 inches above the floor where the top edge is more than 36 inches (914 mm) above the finished floor.
   3. Glass in swinging and sliding doors.
   4. Fixed glass panels located in sliding doors assemblies.
   5. Glass within 24 inches (601 mm) of a door opening that is less than 60 inches (1524 mm) above the finished floor.
   6. Comply with ANSI Z97.1.

1.04 SUBMITTALS

A. Product Data on Glass Types: Provide structural, physical and environmental characteristics, size limitations, special handling or installation requirements.

B. Samples: Sub two samples 6 x 6 inch (150 x 150 mm) in size of wire glass units.

C. Certificates: Certify that products meet or exceed specified requirements.

D. Manufacturer's Certificate: Certify that sealed insulated glass meets or exceeds specified requirements.

1.05 QUALITY ASSURANCE

A. Perform Work in accordance with GANA Glazing Manual, FGMA Sealant Manual, and SIGMA TM-3000 Glazing Guidelines for glazing installation methods. Maintain one copy on site.

B. Installer Qualifications: Company specializing in performing the work of this section with minimum three years experience.

1.06 ENVIRONMENTAL REQUIREMENTS

A. Do not install glazing when ambient temperature is less than 50 degrees F (10 degrees C).

B. Maintain minimum ambient temperature before, during and 24 hours after installation of glazing compounds.

1.07 WARRANTY

A. See Section 01725 - Closeout Submittals, for additional warranty requirements.

B. Provide a ten (10) year warranty to include coverage for sealed glass units from seal failure, interpane dusting or misting, and replacement of same.

PART 2 PRODUCTS

2.01 FLAT GLASS MATERIALS

A. Safety Glass - 1/4 Inch(Type 2): Clear; fully tempered with horizontal tempering.
1. Comply with ASTM C 1036, Type I, transparent flat, Class 1 clear, Quality Q3 (glazing select) and ASTM C 1048.
2. Comply with 16 CFR 1201 test requirements for Category II.
3. 6 mm thick.
4. Provide this type of glazing in the locations required by code.
a. Glazed lites as indicated on the plans.

2.02 SEALED INSULATING GLASS MATERIALS:

A. Type: Low-E Tinted Insulating Glass. Cool gray color, low-reflective glass outdoor appearance.
1. Product: “Solarban®” 70XL (2) “Solargray®” + Clear by PPG Industries, Inc.
2. Insulating Unit Construction: 1/4 inch (6mm) “Solargray®” Glass, “Solarban” 70XL Solar Control (Sputtered) on second surface (2), + 1/2 inch (13mm) air space + 1/4 inch (6mm) Clear Float Glass.
3. Performance Values: Visible Light Transmission – 34 percent; SHGC – 0.20; Shading Coefficient – 0.23; Outdoor Visible Light Reflectance – 6 percent.
4. Heat Transfer Coefficient: U-Value Winter – 0.28, U-Value Summer – 0.26.

2.03 GLAZING ACCESSORIES

A. Setting Blocks: Silicone, 80 to 90 Shore A durometer hardness, ASTM C 864 Option I. Length of 0.1 inch for each square foot (25 mm for each square meter) of glazing or minimum 4 inch (100 mm) x width of glazing rabbet space minus 1/16 inch (1.5 mm) x height to suit glazing method and pane weight and area.

B. Spacer Shims: Silicone, 50 to 60 Shore A durometer hardness, ASTM C 864 Option I. Minimum 3 inch (75 mm) long x one half the height of the glazing stop x thickness to suit application, self adhesive on one face.

C. Glazing Tape: Preformed butyl compound with integral resilient tube spacing device; 10 to 15 Shore A durometer hardness; coiled on release paper; size as recommended by manufacturer for glazing channel and gazing material; black color.
   1. Manufacturers:
      a. Pecora Corporation: www.pecora.com.
      b. Tremco, Inc: www.tremcosealants.com.
      c. Alfas Industrial Sealants: www.alfas.com.
      d. Substitutions: Refer to Section 01600 - Product Requirements.

D. Glazing Gaskets: Resilient polyvinyl chloride extruded shape to suit glazing channel retaining slot; ASTM C 864 Option I; black color.

E. Glazing Clips: Manufacturer's standard type.

2.04 SOURCE QUALITY CONTROL AND TESTS

A. Provide shop inspection and testing for insulated glass.

B. Test samples in accordance with ANSI Z97.1.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify that openings for glazing are correctly sized and within tolerance.

B. Verify that surfaces of glazing channels or recesses are clean, free of obstructions that may impede moisture movement, weeps are clear, and ready to receive glazing.

3.02 PREPARATION

A. Clean contact surfaces with solvent and wipe dry.

B. Seal porous glazing channels or recesses with substrate compatible primer or sealer.

C. Install sealants in accordance with ASTM C 1193 and FGMA Sealant Manual.

D. Install sealant in accordance with manufacturer's instructions.

3.03 INSTALLATION - EXTERIOR DRY METHOD (TAPE AND GASKET SPLINE GLAZING)

A. Cut glazing tape to length; install on glazing pane. Seal corners by butting tape and sealing junctions with butyl sealant.

B. Place setting blocks at 1/4 points with edge block no more than 6 inches (150 mm) from corners.

C. Rest glazing on setting blocks and push against fixed stop with sufficient pressure to attain full contact.

D. Install removable stops without displacing glazing spline. Exert pressure for full continuous contact.

E. Trim protruding tape edge.

3.04 MANUFACTURER'S FIELD SERVICES

A. Glass and Glazing product manufacturers to provide field surveillance of the installation of their products.

B. Monitor and report installation procedures and unacceptable conditions.

3.05 CLEANING

A. Remove glazing materials from finish surfaces.

B. Remove labels after Work is complete.

C. Clean glass and adjacent surfaces.

END OF SECTION

PART 1 GENERAL

1.01 SCOPE OF WORK

A. Furnishing of and paying for all labor, services, appliances, materials and equipment necessary for execution, installation and completing of all work specified herein and as shown on drawings.

B. Section includes:
1. Metal stud wall framing, their accessories and installation (exterior and interior).
2. Ceiling framing system.
3. Metal furring channels, clips, angles, etc. as required to complete this work.
4. Sound attenuation fire blankets and firesafing insulation.
5. Fire rated and non-fire rated gypsum board wall, ceiling and column assembly.
6. Gypsum wallboard.
7. Gypsum sheathing.
8. Installation of various devices required within this work for use of others. Devices shall be furnished and accurately located with erection drawings by using section. Install as required for maximum rigidity.
9. Complete installation of access panels furnished by other sections, as required for access to their work.
10. Taping, mudding, sanding and finishing of all gypsum board walls and ceilings.
11. Trim accessories, polyurethane foam tape gaskets and caulking used within these systems.
12. Anchors, nails, devices and accessories required to install complete all gypsum materials specified herein.

1.02 REFERENCES

A. American Society for Testing and Materials (ASTM)
1. A123 - Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products
2. A525 - Specification for General Requirements for Steel Sheet, Zinc-Coated (Galvanized) by the Hot-Dip Process.
3. C36 - Specification for Gypsum Wallboard
4. C79 - Specification for Gypsum Sheathing Board
5. C475 - Specification for Joint Treatment Materials of Gypsum Wallboard Construction
6. C514 - Specification for Nails for the Application of Gypsum Wallboard
7. C557 - Adhesives for Fastening Gypsum Wallboard to Wood Framing
8. C630 - Water-Resistant Gypsum Backing Board
9. C635 - Specifications for Metal Suspension systems for Acoustical Tile and Lay-in Panel Ceilings
10. C636 - Practices for Installation of Metal Suspension System for Acoustical Tile and Lay-in Panels
11. C645 - Specification for Non-Load (Axial) Bearing Steel Studs, Runners (Track), and Rigid Furring Channels for Screw Application of Gypsum Board.
12. C754 - Specification for Installation of Framing Members to Receive Screw Attached Gypsum Wallboard, Backing Board, or Water Resistant Backing Board.
13. C919
14. C931 - Specification for Exterior Gypsum Soffit Board
15. C1002 - Specification for Steel Drill Screws for the Application of Gypsum Board Material to Light Gauge Steel Studs
16. E90 - Method for Laboratory Measurement of Airborne Sound Transmission Loss of Building Partitions.
17. E119 - Method for Fire Tests of Building Construction and Materials.

B. Gypsum Association (GA)
   1. GA-201 - Gypsum Board for Walls and Ceilings
   2. GA-203 - Installation of Screw-Type Steel Framing Members to Receive Gypsum Board
   3. GA-216 – Recommended Specifications for the Application and Finishing of Gypsum Board
   4. GA-600 – Fire Resistance Design Manual

1.03 SUBMITTALS

A. Submit under provisions of Section 01300.

B. Product Data:
   1. Framing: Provide data describing standard framing member material and finish, product criteria, load charts and limitations.
   2. Gypsum Board System: Product data on gypsum board, joint material, sound attenuation and fire blankets, firesafing insulation, acoustical sealant, joint material, gypsum finishing accessories, gaskets.

1.04 PROJECT RECORD DOCUMENTS

A. Submit under provisions of Section 01 7200.

B. Submittals

1.05 QUALITY ASSURANCE

A. Work under this section will be done in accord with the recommendation of USG "Drywall" Construction Handbook, latest edition, unless otherwise specified herein,

1.06 QUALIFICATIONS

A. Applicator shall have a minimum of three years experience in the installation of gypsum board systems.

1.07 DELIVERY, STORAGE AND HANDLING

A. Deliver, store, protect and handle product to site under provisions of Section 01 6000.

B. Delivery and Handling:
   1. Deliver materials to the project site with manufacturer's labels intact and legible.
   2. Handle materials with care to prevent damage.
   3. Deliver fire rated materials bearing testing agency label and required fire classification numbers.

C. Storage:
   1. Store materials inside under cover; stack flat, off floor.
   2. Stack wallboard so that long lengths are not over short lengths.
   3. Avoid overloading floor system.
   4. Store adhesives in dry area, provide protection against freezing at all times.

1.08 ENVIRONMENTAL CONDITIONS

A. Temperature: During cold weather, in areas receiving wallboard installation, maintain temperature range between 55 degrees F to 70 degrees F for 24 hours before, during and after gypsum wallboard and joint treatment application.

B. Ventilation:
   1. Provide ventilation during and following adhesives and joint treatment applications.
   2. Use temporary air circulators in enclosed areas lacking natural ventilation.
   3. Under slow drying conditions, allow additional drying time between coats of joint treatment.
   4. Protect installed materials from drafts during hot, dry weather.

C. Protection: Protect adjacent surfaces against damage and stains.

1.09 COORDINATION

A. Coordinate work under provisions of Section 01 3900.

PART 2 PRODUCTS

2.01 MANUFACTURERS - FRAMING MATERIAL

A. United States Gypsum Company

B. Other acceptable manufacturers:
   1. Southwest Metals, Inc., Carrollton, Texas
   2. Dietrich Industries, Inc., Pittsburgh, Pennsylvania
   3. Harrison Manufacturing Company, Memphis, Tennessee

C. Substitution: Under provisions of Section 01 6000.

2.02 GYPSUM BOARD CEILING SUSPENSION SYSTEM

A. Manufacturer: Gypsum Board Ceiling Suspension System shall be equivalent to Drywall Furring System, Series DFR as manufactured by National Rolling Mills, Inc., Malvern, Pennsylvania.

B. Materials:
   1. All main beams shall conform to the requirements of Heavy Duty classification of ASTM C635.
   2. Main beams, cross tees and perimeter channel or angle molding base metal shall be fabricated from commercial quality, cold rolled, hot dipped galvanized steel.
   3. Main beams shall be double web construction, capped 15/16 inches wide electrogalvanized painted white flange with 1 ½ inches web height.
   4. Primary cross tees shall be double web construction, 1 ½ inches web height and 1 ½ inch flange width knurled electrogalvanized painted white flange.
   5. Secondary cross tees for lay-in light fixtures shall be double web with an electrogalvanized painted white 15/16 inches flange.
   6. Wall angle molding shall be not less than 1 ½ inch x ¾ inch flanges. Wall channel molding shall be not less than ¾ inch x 1 ¼ inch flanges with 1 9/16 inch web.

2.03 FRAMING MATERIALS (EXTERIOR WALLS)

A. All framing members shall be formed from corrosion-resistant steel (hot dip galvanized), corresponding to the requirements of ASTM A446. Section properties of all studs shall be calculated in accordance with AISI “Specification for the Design of Cold Formed Steel Structural Members” – Latest Edition, and meeting the following requirements:
   1. 2-1/2 inch Cee studs spaced 12 inches o.c. maximum.
      a. Minimum field strength = 40 KSI
      b. Gauge = 12 gauge (0.1046) minimum
      c. Section properties

Ix = .882 minimum
Sx = .706 minimum

2. 4 inch SJ studs spaced 16 inches o.c. maximum
   a. Minimum yield strength = 40 KSI
   b. Gauge = 14 gauge (0.0747) minimum
   c. Section properties
      Ix = 1.2 minimum
      Sx = .60 minimum
3. 6 inch CS studs spaced 16 inches o.c. maximum
   a. Minimum yield strength = 37 KSI
   b. Gauge = 18 gauge (0.0478) minimum
   c. Section properties
      Ix = 1.2 minimum
      Sx = 0.4 minimum
4. Floor and ceiling runners:
   a. To be equivalent to USG CR style in size and gauge to match studs with a minimum yield strength of 33 KSL.
   b. Provide extended leg ceiling runners where occur under structural members.

2.04 FRAMING MATERIAL (INTERIOR WALLS)

A. Interior Drywall Studs and Accessories:
   1. Interior Drywall Studs:
      a. Equivalent to USG "ST" Series, 25 gauge minimum thickness, galvanized interior stud. Stud gauge shall be based on a limiting height base on an allowable deflection of L/240 with type of wall system specified. Reference drawings for stud sizes, spacing and wall thickness.
      b. Equivalent to USG "ST" Series 20 gauge studs, at all door frames (double studs), all borrowed light frames (double studs), framing around various items that cannot be moved otherwise during the renovation, and at any and/or all other locations as specifically shown on drawings.
   2. Interior Floor and Ceiling Runners:
      a. Equivalent to USG CR Galvanized Steel Runner. Same material and thickness as studs. Size as required to fit stud widths as shown on the drawings.
      b. Provide extended leg ceiling runners where occur under structural members.

2.05 FRAMING ACCESSORIES

A. Furring and Bracing Members: Of same material as studs, thickness to suit purpose.

B. USG Cold Rolled Channels: 16 gauge steel, 3/4 inch with 1/2 inch flange, 1-1/2 inch with 17/32 inch flange. Channels shall have black asphaltum paint.

C. USG Metal Furring Channels: Roll formed, hat-shaped sections made of 25 gauge corrosion resistant steel.

D. USG Z-Furring Channels: 24 gauge minimum corrosion resistant steel.

E. Screws and Fasteners:
   1. USG 7/16 inch Super Tite II for attaching metal studs to metal runners; use 5/8 inch where metal thickness exceeds standard 25 gauge.
   2. All others per manufacturer's instructions.
   3. Runner Fasteners: 5/32 inch diameter power driven type with a minimum of 1-1/4 inch minimum penetration into concrete.

4. Powder actuated fastener, such as nails, eye pin hangers, etc. as required.

F. Miscellaneous angles, expansion bellows, channels, attachment devices, girders, braces, etc. to be standard USG galvanized or as recommended or required for secure rigid attachment of condition encountered in strict accord with the latest USG Drywall installation manual.

G. Primer: FSTT-P-645, for touchup of galvanized surfaces.

2.06 FINISHES - FRAMING MATERIAL

A. Studs and Runners: Galvanize to G-60 coating class meeting the requirements of ASTM A446.

B. Accessories: Same finish as framing members or meeting ASTM A123 Hot-Dip Galvanized to 1.25 oz/sq. ft.

2.07 CAVITY SHAFT WALL FRAMING AND ACCESSORIES

A. Cavity Shaft Wall Studs: Equivalent to USG Steel C-H, CH-L, and E-Studs in gauge and length required, hot-dipped galvanized.

B. Floor and Ceiling Runners: Equivalent to USG Steel J-Runners in gauge required, hot-dipped galvanized.

C. Steel Jamb Struts (For Door framing): Equivalent to USG Steel Jamb Strut, 20 gauge, hot-dipped galvanized in length required.

2.08 MANUFACTURER - GYPSUM BOARD MATERIAL

A. United States Gypsum Company

B. Other acceptable manufacturer: Georgia Pacific Corporation

C. Substitution: Under provisions of Section 01 6000.

2.09 GYPSUM BOARD MATERIAL

A. Standard Gypsum Board: 5/8 inch USG “Sheetrock” meeting, ASTM C36, maximum permissible length, ends square cut, tapered edges. (Used in all wall construction requiring non-labeled construction as shown on the drawings.)

B. Fire Rated Gypsum Board: 5/8 USG "Sheetrock" Firecode "C" meeting ASTM C36, maximum permissible length, ends square cut, tapered edges. (Used in all wall construction requiring labeled and non-labeled construction as shown on the drawings.)

C. Moisture Resistant Gypsum Board: 5/8 inch USG W.R. Sheetrock meeting ASTM C630, maximum permissible length, ends square cut, tapered edges. (Used in all walls or ceilings in toilets, janitor closets, showers, and behind ceramic tile where gypsum board is scheduled.)

D. Moisture Resistant Fire Rated Gypsum Board: 5/8 USG W.R. Firecode "C" meeting ASTM C630, maximum permissible length, ends square cut, tapered edges. (Used in all walls or ceilings in toilets, janitor closets, showers, and behind ceramic tile where gypsum board is scheduled.)

E. Sheathing Board: 1/2 inch USG Sheathing meeting ASTM C79, square edges, 48 inches wide by length required. (Used as sheathing over all exterior steel studs.)

2.10 ACCESSORIES

A. Sound Attenuation and Fire Blankets USG Thermafiber Sound Attenuation Fire Blankets in thickness required for the specified wall assembly. Refer to Art. 3.13, Schedule – Wall, Ceiling and Column Types.

B. Firesafing Insulation: USG "Thermafiber Safing Insulation" to be of size required, density 4 pcf., conforming to Federal Spec. HH-I-521E, Type I, for fire safing barrier application.

C. Acoustical Sealant: USG Sheetrock Acoustical Sealant meeting requirements of ASTM C557, complies with ASTM C919. Provide W.R. Sealant where moisture resistant gypsum board occurs.

D. Joint Material:
   1. Joint Compounds: USG brand, type as recommended for the intended use.
      a. Sheetrock Setting-Type or Lightweight Setting-Type Joint Compound (20, 45, 90, 210, 300).
      b. Sheetrock Joint Compound (Taping, Topping, All Purpose).
      c. Sheetrock Ready-Mixed Joint Compound (Taping, Topping, All Purpose).
      d. Sheetrock Lightweight All Purpose Joint Compound Ready-Mixed (Plus 3).
   2. Joint Tape: USG Sheetrock Joint Tape
   3. All material for fire rated assembly shall conform to UL Design requirements.

E. All adhesives: As recommended by the manufacturer.

F. Finishing Accessories:
   1. Casing Bead: No. 200A Steel Series.
   2. Corner Beads: No. 101 Steel Dur-A-Bead.
   3. Taping: USG Perf-A-Tape System.
   4. Expansion Control: USG 093 in strict accord with manufacturer's instructions.
   5. Miscellaneous closure members, wall molds, edge strips, where as shown on drawings or required to be equivalent to "Fry Reglet Corp."

G. Fasteners: Conforming to ASTM C1002. USG 1 inch Super-Tite Drillers for one layer of 5/8 inch gypsum board. 1-5/8 inch Super-Tite Drillers for two layers.

H. Gaskets:
   1. To be polyurethane foam tape 1/8 inch thick x 2 inches wide continuous at all ceilings where gypsum partitions abut the ceiling or other materials as may be encountered.
   2. To be polyurethane foam tape 1/4 inch thick x 3/4 inch wide continuous where gypsum partitions abut exterior wall.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify that site conditions are ready to receive work.

B. Verify that rough-in utilities are in proper location.

C. Verify that building components are ready to receive work.

D. Beginning of installation means acceptance of substrate.

3.02 EXTERIOR STEEL STUD WALL INSTALLATION

A. Conformance to shapes shown on the drawings must be followed for alignment of adjacent finished surfaces.

B. Metal Stud Spacing: 16 inches o.c. unless otherwise noted or scheduled.

C. Floor Slab: Align and secure runner to concrete floor slab at 12 inches o.c. staggered using 5/32 inch diameter by 1-1/4 inch fasteners minimum. Place one continuous bead of caulking full length of exterior wall.

D. Secure top runner as required to structure 12 inches o.c. staggered.

E. Fit runners under and above openings; secure intermediate studs at spacing of wall studs.

F. Provide deflection allowance in stud track, directly below horizontal building framing for non-load bearing framing.

G. Connect studs to tracks using fastener method.

H. Stud splicing not permissible.

I. Construct corners using minimum three studs.

J. Double studs at wall openings, door and window jambs, and not more than 2 inches each side of openings. Provide headers at openings to support all applicable loads.

K. Brace stud framing system and make rigid.

L. Coordinate erection of studs with requirements of door and window frame installed supports and attachments.

M. Align stud web openings with adjacent studs.

N. Coordinate placement of insulation in stud spaces made inaccessible after stud framing erection.

O. Coordinate installation of bucks, anchors, and blocking with electrical and mechanical work to be placed in or behind stud framing.

P. Provide continuous steel framing behind all flashing for secure attachment of all membrane flashing.

Q. Blocking: Secure wood blocking to studs. Install blocking for anchorage of plumbing fixtures, toilet partitions, wall cabinets, toilet accessories, and hardware including wall mounted door stops, etc.

3.03 INTERIOR STEEL STUD WALL INSTALLATION

A. Refer to Article 3.17, Schedule – Wall, Ceiling and Column Types, for type of wall construction.

B. Refer to Drawings for indication of partitions extending through the ceiling to the structure above. Maintain clearance under structural building members to avoid deflection transfer to studs. Provide extended leg ceiling runners.

C. Align all partitions accurately as shown on the drawings. Shape floor and ceiling runners as detailed on the drawings.

D. Attach steel runners at floor and ceiling to structural elements with suitable fasteners located 2 inches from each end and spaced 24 inches o.c.

E. Provide extended leg ceiling runners where occur under structural members. Allow 1/2 inch deflection allowance.

F. Embed floor runner in two continuous beads parallel with runner. Anchor runner 24 inches o.c. maximum to the floor between beads.

G. Secure 25 gauge studs to track using USG Lock Fastener Tool. Secure 20 gauge studs to tracks with low profile screws.

H. Stud splicing permissible. Splice studs with 8 inch minimum nested lap, secure each stud flange with flush head screw.

I. Construct corners using minimum three studs.

J. Double studs at wall openings, door, window jambs, and borrowed light frames, and not more than 2 inches each side of openings. Provide headers at opening to support all applicable loads.

K. Over openings, place horizontally a cut-to-length section of runner, with a web-flange bend at each end, and secure to strut-studs with two screws in each bent web.

L. Where drywall type door frames occur (Section 08100) rough opening shall be of correct dimensions in accordance with approved door frame shop drawings.

M. Brace stud framing system and make rigid.

N. Coordinate erection of studs with requirements of door and window frame supports and attachments.

O. Align stud web openings with adjacent studs.

P. Coordinate installation of bucks, anchors, and blocking with electrical and mechanical work to be placed in or behind stud framing.

Q. Blocking: Secure wood blocking to studs. Install blocking for anchorage of plumbing fixtures, toilet partitions, wall cabinets, toilet accessories and hardware including wall mounted door stops.

R. Coordinate placement of insulation in stud spaces made inaccessible after stud framing erection.

3.04 WALL FURRING INSTALLATION

A. Erect wall furring for direct attachment to concrete block walls.

B. Erect furring channels horizontally. Secure in place on alternate channel flanges at maximum 24” o.c.

C. Secure in place on alternate channel flanges at maxim 24 inches o.c.

D. Space furring channels maximum 16 inches o.c.

3.05 CEILING ERECTION SYSTEM (CHANNEL FRAMING)

A. Space 8 gauge hanger wires 48 inches o.c. along carrying channels and within 6 inches of ends of carrying-channel run. Securely attach to structure.

B. Install 1-1/2 inch carrying channels 48 inches o.c., and within 6 inches of walls. Position channels for proper ceiling height, level, and secure with hanger wire saddle-tied along channel. Provide 1 inch clearance between runners and abutting walls and partitions. At channel splices, interlock flanges, overlap ends 12 inches and secure each end with double-strand 18 gauge tie wire.

C. Erect 7/8” metal furring channels at right angles to 1-1/2 inch carrying channels or main supports. Space furring 16 inches o.c. and within 6 inches of walls. Provide 1 inch clearance between furring ends and abutting walls and partitions. Secure furring to carrying channels with clips or wire-tie to supports with double-strand 18 gauge wire. At splices, nest furring channels at least 8 inches and securely wire-tie each end with double strand 18 gauge wire.

D. At light troffers or any openings that interrupt the carrying of furring channels, install additional cross reinforcing to restore lateral stability or grillage.

E. Screw attach gypsum board to framing.

3.06 GYPSUM BOARD CEILING AND FRAMING INSTALLATION

A. The Drywall Framing System (reference Article 2.02) shall be installed in accordance with ASTM C636. Deflection of any component shall not exceed 1/360 of the span.

B. Main beams shall be suspended from the overhead construction with 12 gauge galvanized steel hanger wires, spaced 48 inches maximum o.c. along the length of the main beams.

C. Cross tees shall be spaced 24 inches o.c.

D. Perimeter angle or channel moldings shall be installed at the specified ceiling height at the intersection of the suspended ceiling and all vertical surfaces.

E. ½ inch gypsum board panels shall be screw attached to drywall furring system using bugle head drywall screws spaced in accordance with the instruction of the gypsum board manufacturer. Stagger end joints over supports.

3.07 CEILING FURRDOWNS AND SOFFIT SYSTEM

A. Attach 6 inch steel studs (or other as required) by inserting in 6 inch steel stud runners which are attached to adjacent masonry or steel stud walls. Attach with 2 pan head screws.

B. Install 1 5/8 inch stud cross bracing over ceiling framing; space at 48 inches o.c. and attached with 2 screws at each member.

C. At hangers, install 12 inch long stud section for box reinforcing (or lap studs 12 inches minimum). Secure each end with 2 screws.

D. Hangers: Minimum 9 gauge wire.

E. Contractor may elect to use 1 ½ inch structural plaster channels with cross framing in lieu of studs. Conform to USG requirements for secure anchorage and support.

F. Screw attach gypsum board at ceiling framing.

3.08 INSULATION INSTALLATION

A. Refer to drawings and Article 3.17, Schedule – Wall, Ceiling and Column Types, for location of wall or ceiling insulation.

B. Sound Attenuation Fire Blanket Installation (Interior Walls): Install Sound Attenuation Fire Blankets after gypsum panels are applied to one side of studs and before panels are applied to other side of studs. Insert the 16 inch wide blanket in the stud cavity, by bowing the blanket slightly. After inserting, make a vertical cut between the studs. Slit the blanket with a sharp utility or hookbill knife to ease the pressure of the blanket against the gypsum panels when they are installed. Butt ends of blankets closely together and fill all voids. Install blanket between all service boxes.

C. Firesafing Insulation: Install safing insulation in void or opening requiring sound or fire rated construction. Cut safing wider than opening to ensure compression fit.

3.09 EXTERIOR SHEATHING INSTALLATION

A. Erect exterior sheathing horizontally with edges butted tight and ends occurring over firm bearing.

B. Screw-attach Sheathing to exterior of each stud with 1 inch Type S-12 Climaseal Coated Screws spaced 3/8 inch from ends and edges and approximately 8 inches o.c. Apply sealant around sheathing perimeter at interface with other materials and install flashing as indicated on the drawings. Do not use brick ties in lieu of this attachment.

3.10 GYPSUM BOARD INSTALLATION

A. Position all ends and edges of all gypsum panels over framing members, except when joints are at right angles to framing members as in perpendicular application or when end joints are back-blocked.

B. Apply gypsum panels first to the ceiling (where scheduled) and then to the vertical walls. Extend ceiling board into corners and make firm contact with top plate. To minimize end joints, use panels of maximum practical lengths. Fit ends and edges closely, but not forced together. Stagger end joints in successive courses with joints on opposite sides of a partition placed on different studs.

C. Install gypsum board vertically in full sheets where possible. No short patch or scrap pieces will be permitted. Keep joints to a minimum. All joints must occur over a support. Avoid screw heads projecting outward thereby forcing misalignment or waves in gypsum surface.

D. Cut gypsum panels a minimum 1/4 inch shorter than the height required with 1/4 inch gap at floor for acoustical caulking. Use 1/4 inch thick shims at the floor to support panels until all screws are installed.

E. Attach panels to framing supports (Power Driven USG Screws). Space fasteners not less than 3/8 inch from edges and ends of panels and drive as recommended for specified fastening method. Drive fasteners in field of panels first, working toward ends and edges. Hold panel in firm contact with framing while driving fasteners. Drive fastener heads slightly below surface of gypsum panels in a uniform dimple without breaking face paper.

F. Cut ends, edges, scribe or make cutouts within field of panels in a workmanlike manner.

G. Trim Members:
   1. Install casing beads where gypsum board abuts dissimilar materials.
   2. Install corner beads on all exterior corners.
   3. Tape all interior corners.
   4. Tape joints and finish where new gypsum partitions abut or appear as a continuation of existing gypsum partitions.
   5. Install expansion joints in accord with manufacturer's instructions.

H. Bind all edges abutting material other than gypsum board with casing bead.

I. Install double layers of gypsum board where required and shown on the drawings for the walls indicated in full accord with the manufacturer's instructions.

J. Caulk floor, wall and ceiling perimeter as required to fire and acoustical requirements with acoustical caulking.

3.11 JOINT TREATMENT APPLICATION (INTERIOR)

A. Mix joint compound in strict accordance with manufacturer's instructions.

B. Apply taping and embedding compound in a thin uniform layer to all joints and angles to be reinforced. Immediately apply sheetrock joint tape centered over joint and seated into compound. Follow immediately with a thin skim coat to embed tape, but not to function as a second coat. Fold and embed tape properly in all interior angles to provide a true angle. The tape or embedding coat must be thoroughly dry prior to application of second coat.

C. Apply second coat of joint compound over embedding coat filling panel taper flush with surface cover tape and feather out at least 2 inches beyond first coat. On joints with no taper, cover tape and feather out at least 4 inches on either side of tape. Allow second coat to dry thoroughly prior to application of finish coat.

D. Sand thoroughly and spread finish coat evenly over and extend at least 2 inches beyond second coat on all joints and feather to a smooth uniform finish. Over tapered edges, do not allow finished joint to protrude beyond plane of the surface. Apply a finish coat to cover tape. Apply taping compound at all taped angles and provide a true angle. Sand between coats and following the final application of compound, to provide a smooth surface ready for decoration.

E. Gypsum board material above ceilings are finished and taped, fastener depressions filled. however final sanding is not required.

F. Finishing Fasteners: Apply a taping, all-purpose type compound to fastener depressions as the first coat. Follow with a minimum of two additional coats of topping or all-purpose compound, leaving all depressions level with the plane of the surface.

G. Finishing Beads and Trims:
   1. Apply first coat to all bead and trim and properly feather out from ground to plane of surface. Compound must be thoroughly dry prior to application of second coat.
   2. Apply second coat in same manner as first coat, extending compound slightly beyond onto face of panel. Compound must be thoroughly dry prior to application of finish coat.
   3. Apply finish coat to all bead and trim, extending compound slightly beyond the second coat and properly feathering from ground to plane of surface. Sand finish coat as necessary to provide a flat smooth surface ready for decoration.

H. Apply "Surface Sealer" equal to that manufactured by USG to all gypsum surfaces within toilet room and/or wet locations. Apply sealer in accord with manufacturer's direction, after taping and finishing of all joints.

3.12 TOLERANCES

A. Maximum variation from true flatness 1/8 inch in 10 feet in any direction.

B. Maximum variation of any member from plane: 1/8 inch.

3.13 CLEANING

A. Clean soiled or discolored surfaces after installation.

B. Touch up scratches, abrasions, voids and other defects in gypsum surfaces.

C. Remove and replace damaged or improperly installed material and protect for painting. Reference Section 09900.

D. Remove all debris from work site and clean up all residue from this work.

3.16 SCHEDULE – WALL, CEILING AND COLUMN TYPES

A. Reference Drawings for the following types:
1. Partitions extending with gypsum both sides to deck.
2. Partitions (studs to deck) with gypsum board stopping above ceiling.
3. Gypsum partitions abutting ceiling construction.
4. Partitions of fire rated construction in accord with rating required.
5. Partition with acoustical performance requirements.

B. Sound Integrity:
1. The sound transmission integrity of these partitions must be maintained as a minimum average as schedules.
2. Caulk entire perimeter of partition units. Completely seal all cracks. No openings may remain through walls.
3. Seal with caulking all service boxes (electric, etc.) which penetrate either face of wall. Do not back electric outlets to electric outlets.

C. Wall and Ceiling Types:
1. **Type W-1 – Typical Sound Rated Wall Assembly:** To be one (1) layer of 5/8 inch Firecode gypsum board each side of a 3-5/8 inch 25 gauge steel stud or other stud widths as shown on the drawings. Partitions to extend from floor slab to deck above with all joints finished, gypsum board screw attached, and caulked full perimeter and at openings. Provide 1-1/2 inch Therma fiber batt full height of partition where shown on drawings. 47 STC minimum sound rating.
2. **Type W-2 – One Hour Fire Rated Wall Assembly:** To be one (1) layer of 5/8 inch Firecode gypsum board each side of a 3-5/8 inch 25 gauge steel stud or other stud widths as shown on the drawings with 2 inch Thermafiber batt full height of partition for a 1 Hr. UL-419 fire rated separation assembly. Partitions to extend from floor slab to deck above with all joints finished, gypsum board screw attached, and full perimeter caulked including all openings. Requires special construction for wall penetrations (outlets, etc.).
3. **Type W-3 – Two Hour Fire Rated Wall Assembly:** To be two (2) layers of 5/8 inch Firecode gypsum board applied to each side of a 3-5/8 inch 25 gauge steel stud or other stud widths as shown on the drawings with 2 inch Thermafiber batt full height of partition for a 2 Hr. UL-U412 fire rated separation assembly. Partitions to extend from floor slab to deck above with all joints

staggered, screw attach gypsum board with full perimeter caulked including all openings. 48 STC minimum sound rating. Requires special construction for wall penetrations (outlets, etc.).

4. **Type W-4 – Wall Furring:** To be one (1) layer of 5/8 inch Firecode gypsum board on 7/8 inch metal hat channels spaced 16 inches o.c. vertically or horizontally attached to concrete or concrete block back-up. Gypsum board to extend a minimum of 4 inches above finish ceiling.
5. **Type C-1 – Typical Non-Rated Ceiling Assembly:** To be one (1) layer of 5/8 inch Gypsum Board applied at right angles to 7/8" rigid furring channels at 16 inches o.c. with 1" Type S drywall screws at 12" o.c. Furring channels are applied at right angles to 1-1/2 inch rigid carrying channels at 48 inches o.c. Attach carrying channels with 8 gauge hanger wire to structure.
6. The above wall and ceiling types may not be inclusive of all wall construction to be encountered. The Contractor is to furnish and install all walls whether or not specified herein complete with all accessories without additional cost to the Owner.

END OF SECTION

PART 1 - GENERAL

1.01 Apply the applicable provisions of Division 0 and Division 1 to all the work specified in this Section.

1.02 Submittals:

A. Comply with the pertinent provisions of Section 013000.

B. Product Data: Not more than sixty (60) calendar days after receipt of the Owner's Notice to Proceed, submit the following:
   1. List of materials or products to be provided under this Section;
   2. Manufacturer's specifications or other technical data as necessary to prove compliance with the specified requirements; and
   3. Manufacturer's printed application instructions for floor leveler.

C. Samples:
   1. Submit specified tile and grout mounted on sample board.
   2. Submit samples of all accessories and trim, including marble or manmade marble thresholds.

D. Master Grade Certificate

PART 2 - PRODUCTS

2.01 Acceptable Manufacturers and Products:

A. The following manufacturers and associated products are approved for use in the Work:
   1. Porcelain Floor Tile PT1:
      a. Manufacturer: Atlas Concorde USA
      b. Style: Cove
      c. Size: Hexagon (9 7/8" x 8 ½")
      d. Refer to Drawings for tile pattern plan and color

   2. Porcelain Floor Tile PT2:
      a. Manufacturer: Atlas Concorde USA
      b. Style: Cove
      c. Size: 23 5/8" x 47 ¼"
      d. Refer to Drawings for tile pattern plan and color

   3. Porcelain Wall Tile PWT1:
      a. Manufacturer: American Olean
      b. Style: Color Story Wall
      c. Size: 4" x 12"
      d. Refer to Drawings for tile pattern plan and color

   4. Porcelain Wall Tile PWT2:
      a. Manufacturer: American Olean
      b. Style: Color Story Wall
      c. Size: 4" x 12"
      d. Refer to Drawings for tile pattern plan and color

   5. Porcelain Tile Cove Base PTB1:
      a. Manufacturer: Atlas Concorde USA
      b. Style: Cove
      c. Refer to Drawings for tile pattern plan and color

6. Porcelain Tile Cove Base PTB2:
   a. Manufacturer: Atlas Concorde USA
   b. Style: Cove
   c. Refer to Drawings for tile pattern plan and color

7. Waterproofing Membrane:
   a. Manufacturer: Laticrete
   b. Product Line: 9235 Waterproofing Membrane
8. Sound control Underlayment and Crack Suppressive Membrane:
   a. Manufacturer: Laticrete
   b. Product Line: 170 Sound & Crack Isolation Control Mat
9. Adhesive:
   a. Manufacturer: Laticrete
   b. Product Line: Latapoxy 300
10. Grout:
    a. Manufacturer: Laticrete
    b. Product Line: Permacolor
11. Grout Release Agent:
    a. Manufacturer: As recommended by tile manufacturer
    b. Product Line: As recommended by tile manufacturer
12. Expansion and Control Joint Sealant:
    a. Manufacturer: Laticrete
    b. Product Line: Latasil

2.02 Materials:

A. Porcelain: Master Grade complying with ANSI A137.1

B. Adhesive: ANSI A136.1, Type 1

C. Grout: ANSI A118.6

D. Portland Cement: ASTM C150, Type 1 or 1A

E. Sand: ASTM C144

F. Water: Potable

PART 3 - EXECUTION

3.01 Environmental:

A. Comply with the pertinent provisions of Section 016000.

B. Install the products and materials herein specified only of the receiving spaces are properly conditioned.

C. Do not install the materials or products herein specified if the receiving spaces are being heated by temporary appliances of any type.

D. For 48 hours prior to and after the installation, maintain a minimum ambient air temperature of 55º F with 40±5% RH.

3.02 Preparatory Work:

A. Examine the conditions under which the work of this section will be performed.

B. Verify that the concrete floor slabs are within the tolerances specified in Section 033010.

C. If the concrete floor slabs are not within the specified tolerances, notify the Architect and employ the leveler coat herein specified to achieve the required tolerances. Apply the leveler coat as recommended by the manufacturer. Do not exceed maximum allowable thickness. If necessary, grind down high spots.

D. Determine that the floor slab and leveler coat, if used, are adequately cured and dry by performing moisture content tests recommended by the tile and adhesive manufacturers. Do not rely on visual examination to determine acceptable dryness or moisture content.

E. Clean the surface of the concrete floor slab and remove the following:
1. Dirt, dust and debris;
2. Laitance and liquid membrane-forming curing compounds;
3. Wax, grease, oil or other contaminants which might interfere with the adhesive bond.
4. If the surface of the concrete floor slab is glossy or if recommended by the adhesive manufacturer, dull or mechanically etch the surface.

F. Lay-out tile work in advance to determine the location and size of cuts. Generally, start at the center of the space, discounting minor offsets. Adjust location of starting center so that cut pieces will not be less than ½ a tile width.

3.03 Installation:

A. Waterproofing:
1. Install waterproofing membrane in compliance with current revisions of ANSI A108.01 and ANSI 108.13. Review the installation and plan the application sequence per manufacturer's recommendations.
2. Pre-treat all substrate cracks, cold-joints, control joints, coves, corners and penetrations according to manufacturer's specific recommendations. Allow pre-treated areas to dry to the touch.
3. Apply a liberal coat of waterproofing membrane with brush or roller over substrate including pre-treated areas and allow to dry to touch.
4. Apply another liberal coat of waterproofing membrane over all areas to seal. When last coat has dried to the touch, inspect final surface for pinholes, voids or thin spots. Use additional waterproofing membrane to seal all defects.
5. Allow waterproofing membrane to cure for seven (7) days minimum at 70°F and 50% RH before performing water penetration tests as recommended per specific manufacturer.

B. Sound and Crack Isolation Mat
1. Install a perimeter isolation strip before placing and trimming the Sound & Crack Isolation Mat per specific manufacturer's recommendations.
2. Adhere the Sound & Crack Isolation Mat to the Concrete Area substrate. Concrete shall be in place for 28 days (minimum) and shall be dry. The surface shall have a smooth finish and be free of voids, sharp protrusions and loose aggregate. All surfaces should be between 40°F (4°C) and 90°F (32°C) and structurally sound, clean and free of all dirt, oil, grease, paint, concrete sealers or curing compounds and cement laitance. Rough or uneven concrete surfaces should be made smooth with a LATICRETE Latex Portland cement underlayment to provide a wood float or better finish.
3. Use a ¼" x ¼" notched trowel nd comb mortar over substrate, apply only enough Sound & Crack Isolation Mat into place, in the thin set adhesive mortar. Once installed, use a 25-45 lbs

(11.3-20kg) roller to embed the Sound & Crack Isolation Mat firmly into the thin set adhesive mortar. Allow to cure perr instructions on this set adhesive package. Install Sound & Crack Isolation Mat over the area to be treated, do not overlap edges but be sure edges of each piece butt firmly together. Trim length of mat to desired length and width. Once fully cured, install porcelain tile directly over the Sound & Crack Isolation Mat per specific manufacturer's recommendations.

C. Tile Placement:
1. Mix the adhesive as recommended by the manufacturer using the appropriate tools and the admixture herein specified in lieu of water. Ensure that the adhesive is not over or under mixed.
2. Spread the adhesive herein specified using the method and notched trowel recommended by the manufacturer in order to obtain maximum contact between substrate, tile and adhesive without gaps, air-pockets or honeycombs.
3. Do not spread the adhesive too far in advance of tile placement and do not place tile in adhesive which has begun to cure.
4. Place tiles in adhesive and push or tamp into position with a rubber-headed mallet or similar tool. Ensure that contact between tile and adhesive is complete and solid.

D. Grouting:
1. Allow the adhesive to cure properly as recommended by the manufacturer but allow to cure for at least 24 hours.
2. Mix the grout as recommended by the manufacturer using the appropriate tools and the admixture herein specified in lieu of water. Ensure that the grout is not over or under mixed.
3. Spread the grout using the method and tool recommended by the manufacturer. Use an adequate quantity of grout and work so that the joints are completely filled without gaps, air-pockets or honeycombs.
4. Allow the grout to take initial set and then remove as much residue as possible without using any chemicals.
5. Allow the grout to set for at least 24 but not more than 48 hours and then remove the remaining residue using the materials herein specified.

E. Expansion and Control Joints:
1. Provide control or expansion joints as located in contract drawings and in full conformity, especially in width and depth, with architectural details.
   a. Substrate joints must carry through, full width, to surface of tile, brick or stone.
   b. Install expansion joints in tile, brick or stone work over construction/cold joints or control joints in substrates.
   c. Install expansion joints where tile, brick or stone abut restraining surfaces (such as perimeter walls, curbs, columns), changes in plane and corners.
   d. Joint width and spacing depends on application-follow TCNA "Handbook for Ceramic Tile Installation" Detail "EJ-171 Expansion Joints" or consult sealant manufacturer for recommendation based on projet parameters.
   e. Joint width: ≥1/8" and ≤1".
   f. Joint width: depth~2:1 but joint depth must be ≥1/8" and ≤1/2".
   g. Layout (field defined by joints): 1:1 length: width is optimum but must be ≤2:1.

   Remove all contaminants and foreign material from joint spaces/surfaces, such as dirt, dust, oil, water, frost, setting/grouting materials, sealers and old sealant/backer. Install appropriate Backing Material. Apply masking tape to face of tile, brick or stone veneer. Use caulking gun, or other applicator, to completely fill joints with sealant. Within 5-10 minutes of filling joint, 'tool' sealant surface to a smooth finish. Remove masking tape immediatedly after tooling joint. Wipe smears or excess sealant off the face of non-glazed tile, brick, stone or other absorptive surfaces immediately.

3.04 Protection:

A. Upon completion of the work, ensure through the use of adequate coverings such as tarpaulins or heavy Visqueen that the completed work will not be damaged or soiled by workmen or subcontractors whose work follows the tile work or by workmen that will use the area for any purpose.

B. Prohibit traffic of any type on newly tiled and grouted floors at least 48 hours after completion.

3.05 Cleaning:

A. Comply with the pertinent provision of Section 017000.

B. Prior to final acceptance by the Owner, completely clean the porcelain tile and joints. Remove any accumulated dust, dirt and stains.

3.06 Extra Materials:

A. Tiles: 1 boxes or cartons;

B. Base: 1 boxes or cartons;

C. Adhesive: 1 gallon or enough bag material to produce 1 gallon;

D. Grout: 1 gallon or enough bag material to produce 1 gallon; and

E. Admixture: 1 gallon.

END OF SECTION

PART 1 - GENERAL

1.01 SCOPE OF WORK

A. The furnishing of and paying for all labor, material, services, appliances and equipment necessary for execution, installation and completion of all work specified herein and as shown on drawings.

B. Section includes:
   1. Lay-in acoustical type ceiling tile board including installation complete with suspension system, grid, hangers, etc.
   2. Required metal molding, edge strips, hangers, screws, rivets, etc., required to complete the installation of all above.

1.02 REFERENCES

A. American Society for Testing and Materials (ASTM)
   1. C635 - Specification for Metal Suspension Systems for Acoustical Tile and Lay-in Panel Ceilings.
   2. C636 - Practice for Installation of Metal Suspension System for Acoustical Tile and Lay-in Panels.
   3. E84 - Test Method for Surface Burning Characteristics of Building Materials

B. Underwriters' Laboratories, Inc. (UL) Fire Resistance Directory Latest Edition

C. Seismic Bracing of Ceiling: Standard Building Code, latest edition.
   1. Standard Building Code, latest edition
   2. CISCA Seismic Zones 3 & 4 - Ceilings and Interior Systems Construciton Association Guidelines for Sesmic Restraint for Direct Hung Suspended Ceiling Assemblies.

1.03 SUBMITTALS

A. Submit under provisions of Section 013000.

B. Product Data: Provide data on metal grid system components and acoustic units.

C. Samples:
   1. 12 inch x 12 inch samples of each new acoustical unit to be used, matched or replaced.
   2. Submit sample of suspension system, main tees and cross tees, and hold down clips.

1.04 PROJECT RECORD DOCUMENTS

A. Submit under provisions of Section 017200.

B. Submittals

1.05 QUALIFICATIONS

A. Grid Manufacturer: Company specializing in manufacturing the Products specified in this section with minimum five years' experience.

B. Acoustical Unit Manufacturer: Company specializing in manufacturing the Products specified in

this section with minimum five years documented experience.

C. Installer: Company specializing in performing the work of this section with a minimum of three years' documented experience.

1.06 DELIVERY, STORAGE AND HANDLING

A. Deliver, store, protect and handle products to site under provisions of Section 016000.

B. Deliver materials in original, unopened, protective packaging, with manufacturer's labels indicating brand name, pattern, size, thickness and fire rating as applicable, legible and intact.

C. Store materials in original protective packaging to prevent warping, soiling, physical damage or wetting.

D. Store cartons open at each end to stabilize moisture content and temperature.

E. Do not begin installation until sufficient materials to complete a room are received.

F. Ceiling material storage time at the job site should be as short as possible and environmental conditions should be as near as possible to those specified for occupancy.

1.07 ENVIRONMENTAL REQUIREMENTS

A. Before ceiling material is installed, units (panels of tile) shall reach room temperature and have a stabilized moisture content. Do not install in spaces where temperature or humidity conditions vary greatly from temperatures and conditions that will be normal in the occupied space.

B. Acoustical materials are interior finish products and are designed for installation within the normal expected occupancy range of 60 to 85 degrees F. Relative humidity should be no more than 70 percent. All plastering, concrete, terrazzo, or any other wet work should be complete and dry. All windows and doors should be in place. The heating, ventilating, and air-conditioning systems shall be installed and operable where necessary to maintain proper temperatures before, during, and after installation of acoustical materials.

1.08 SCHEDULING

A. Sequence work to ensure acoustical ceilings are not installed until building is enclosed, sufficient heat is provided, dust generating activities have terminated, and overhead work is completed, tested, and approved.

B. Install acoustical units after interior wet work is dry.

1.09 EXTRA MATERIALS

A. Furnish under provisions of Section 017000.

B. Provide in full carton lots a minimum of 12 pieces of each type Acoustic Tile used for the Owner's use, in undamaged and marked cartons. These shall not be used for replacement as stipulated in Article 3.05 herein for final acceptance.

PART 2 - PRODUCTS

2.01 MANUFACTURERS - SUSPENSION SYSTEM

A. Armstrong World Industries.

2.02 SUSPENSION SYSTEM MATERIAL

A. Grid Type 1:
   1. Non-fire Rated Prelude XL Grid: ASTM C635, exposed T; components die cut and interlocking.
   2. Grid Materials: Commercial quality cold rolled steel with galvanized coating.
   3. Exposed Grid Surface Width: 15/16 inch.
   4. Grid Finish: White

B. Accessories:
   1. Clips, splices, edge moldings, hold down clips required for suspended grid system.
   2. BERC2 - 2 inch Beam End Retaining Clip, 0.034 inch thick, hot -dipped galvanized cold-rolled steel per ASTM A568 - used to join main beam or cross tee to wall molding.

D. Hanger Wire: 12 gauge annealed galvanized. Uncoil and stretch before use.

E. Tie Wire: 18 gauge soft annealed. Uncoil and stretch before using.

2.03 MANUFACTURER - ACOUSTICAL UNITS

A. Armstrong World Industries.

2.04 ACOUSTIC UNITS MATERIAL

A Acoustical Panels - (Type ACT-4) Armstrong Optima No. 3152 square lay-in,(2x2)

2.05 ACCESSORIES

A. Adhesives (Where required): Adhesives to be as recommended by the manufacturer for the exact application encountered.

B. Touch-up Paint: Type and color to match acoustical and grid unit.

PART 3 - EXECUTION

3.01 EXAMINATION

A. Cooperate with all other subcontractors, particularly electrical, mechanical and sprinkler, in working to and locating their fixtures, grilles, heads, etc. Header around all such openings with tees or edge mould as required, to form proper grid opening for all items.

B. Verify that layout of hangers will not interfere with other work.

C. Provide all protection of adjacent material required by this operation and remove at completion.

3.02 INSTALLATION - LAY-IN GRID SUSPENSION SYSTEM

A. Ceiling suspension system shall be installed level using the "laser" method to the heights as scheduled or shown on drawings.

B. Install suspension system in accordance with manufacturer's instructions and as supplemented in this section including seismic bracing as required in section 1.02 References, paragraph C. of this section.

C. Install system capable of supporting imposed loads to a deflection of 1/360 maximum.

D. Locate system on room axis according to reflected plan.

E. Install after major above ceiling work is complete. Coordinate the location of hangers with other work.

F. Hang suspension system independent of walls, columns, ducts, pipes and conduit. Where carrying members are spliced, avoid visible displacement of face plane of adjacent members.

G. Where ducts or other equipment prevent the regular spacing of hangers, reinforce the nearest affected hangers and related carrying channels to span the extra distance.

H. Do not support components on main runners or cross runners; support components independently as follows:
   1. Fixtures at ceiling: Provide additional hanger wires independent of ceiling support system to support light fixtures, heating diffusers, heating grilles, and audio speakers, either surface mounted or lay-in type.
   2. Lighting fixtures are to be secured in grid per NFPA requirements.
   3. Ceiling grid is to be supported and braced in full accord with Seismic Requirements.
   4. Support required for items 3.02.H.1, 2 and 3 to be provided by section 09510 contractor.

I. Install edge molding at intersection of ceiling and vertical surfaces, using longest practical lengths. Miter corners. Provide edge moldings at junctions with other interruptions.

3.03 INSTALLATION - ACOUSTICAL UNITS

A. Install acoustical units in accordance with manufacturer's instructions.

B. Fit acoustical units in place, free from damaged edges or other defects detrimental to appearance and function.

C. Lay directional patterned units one way with pattern parallel to shortest room axis. Fit border trim neatly against abutting surfaces.

D. Install units after above ceiling work is complete.

E. Install acoustical units level, in uniform plane, and free from twist, warp and dents.

F. Cut panels to fit irregular grid and perimeter edge trim.

G. Install hold-down clips to retain panels tight to grid system within 25 feet of an exterior door.

3.04 ERECTION TOLERANCES

A. Maximum variation from flat and level surface: 1/8 inch in 10 feet.

3.05 REPLACEMENT

A. Before final acceptance, this contractor will be required to replace all soiled or damaged units and/or panels of all work specified herein.

3.06 CLEANING

A. Clean soiled or discolored unit surfaces after installation.

B. Touch up scratches, abrasions, voids, and other defects in painted surfaces.

C. Remove and replace damaged or improperly installed units.

D. Remove all equipment and excess material and have premise clean of all debris.

END OF SECTION

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Section Includes

Drawings and general conditions of Contract, including General and Supplementary Conditions and Divisions-1 Specification sections apply to work of this section

1.2 SUMMARY

A. Section Includes

1. Acoustical metal ceiling panels
2. Exposed grid suspension system
3. Wire hangers, fasteners, main runners, cross tees, and wall angle moldings
4. Perimeter Trim

B. Related Sections:

1. Divisions 23 - HVAC Air Distribution
2. Division 26 - Electrical

C. Alternates

1. Prior Approval: Unless otherwise provided for in the Contract documents, proposed product

substitutions may be submitted no later than TEN (10) working days prior to the date established for receipt of bids. Acceptability of a proposed substitution is contingent upon the Architect's review of the proposal for acceptability and approved products will be set forth by the Addenda. If included in a Bid are substitute products that have not been approved by Addenda, the specified products shall be provided without additional compensation.

2. Submittals that do not provide adequate data for the product evaluation will not be considered. The proposed substitution must meet all requirements of this section, including but not necessarily limited to, the following: Single source materials suppliers (if specified in Section 1.5); Underwriters' Laboratories Classified Acoustical performance; Panel design, size, composition, color, and finish; Suspension system component profiles and sizes; Compliance with the referenced standards.

1.3 REFERENCES

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

1. ASTM A 1008 Standard Specification for Steel, Sheet, Cold Rolled, Carbon, Structural, High-Strength Low-Alloy and High-Strength Low-Alloy with Improved Formability

2. ASTM A 641 Standard Specification for Zinc-Coated (Galvanized) Carbon Steel Wire

3. ASTM A 653 Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) by the Hot-Dip Process

Method

4. ASTM C 423 Sound Absorption and Soun Absorption Coefficients by the Reverberation Room

5. ASTM C 635 Standard Specification for Metal Suspension Systems for Acoustical Tile and Lay-in Panel Ceilings

6. ASTM C 636 Recommended Practice for Installation of Metal Ceiling Suspension Systems for Acoustical Tile and Lay-in Panels

7. ASTM D 3273 Standard Test Method for Resistance to Growth of Mold on the Surface of Interior Coatings in an Environmental Chamber

8. ASTM E 84 Standard Test Method for Surface Burning Characteristics of Building Materials

9. ASTM E 580 Installation of Metal Suspension Systems in Areas Requiring Moderate Seismic Restraint

10. ASTM E 1111 Standard Test Method for Measuring the Interzone Attenuation of Ceilings Systems

11. ASTM E 1414 Standard Test Method for Airborne Sound Attenuation Between Rooms Sharing a Common Ceiling Plenum

12. ASTM E 1264 Classification for Acoustical Ceiling Products

B. International Building Code

C. ASHRAE Standard 62 1 2004 Ventilation for Acceptable Indoor Air Quality

D. NFPA 70 National Electrical Code

E. ASCE 7 American Society of Civil Engineers, Minimum Design Loads for Buildings and Other Structures

F. International Code Council-Evaluation Services - AC 156 Acceptance Criteria for Seismic Qualification Testing of Non-structural Components

G. International Code Council-Evaluation Services Report - Seismic Engineer Report

1. ESR 1308 - Armstrong Suspension Systems

H. International Association of Plumbing and Mechanical Officials - Seismic Engineer Report

1. 0244 - Armstrong Single Span Suspension System

I. California Department of Public Health CDPH/EHLB Emission Standard Method Version 1.1 2010

J. LEED - Leadership in Energy and Environmental Design is a set of rating systems for the design, construction, operation, and maintenance of green buildings

1.4 SYSTEM DESCRIPTION

Continuous/Wall-to-Wall - Roof Edge to: Roof Edge

1.5 SUBMITTALS

A. Product Data: Submit manufacturer's technical data for each type of acoustical ceiling unit and suspension system required.

B. Samples: Minimum 6 inch x 6 inch samples of specified acoustical panel; 8 inch long samples of exposed wall molding and suspension system, including main runner and 4 foot cross tees.

C. Shop Drawings: Layout and details of acoustical ceilings show locations of items that are to be coordinated with, or supported by the ceilings.

D. Certifications: Manufacturer's certifications that products comply with specified requirements, including laboratory reports showing compliance with specified tests and standards. For acoustical performance, each carton of material must carry an approved independent laboratory classification of NRC, CAC, and AC.

E. If the material supplied by the acoustical subcontractor does not have an Underwriter's Laboratory classification of acoustical performance on every carton, subcontractor shall be required to send material from every production run appearing on the job to an independent or NVLAP approved laboratory for testing, at the architect's or owner's discretion. All products not conforming to manufacturer's current published values must be removed, disposed of and replaced with complying product at the expense of the Contractor performing the work.

1.6 QUALITY ASSURANCE

A. Single-Source Responsibility: Provide acoustical panel units and grid components by a single manufacturer.

B. Fire Performance Characteristics: Identify acoustical ceiling components with appropriate markings of applicable testing and inspecting organization.

a. Surface Burning Characteristics: As follows, tested per ASTM E 84 and complying with ASTM E 1264 Classification.

C. Acoustic Panels: As with other architectural features located at the ceiling, may obstruct or skew the planned fire sprinkler water distribution pattern through possibly delay or accelerate the activation of the sprinkler or fire detection systems by channeling heat from a fire either toward or away from the device. Designers and installers are advised to consult a fire protection en gineer, NFPA 13, or their local codes for guidance where automatic fire detection and suppression systems are present.

D. Coordination of Work: Coordinate acoustical ceiling work with installers of related work including, but not limited to building insulation, gypsum board, light fixtures, mechanical systems, electrical systems, and sprinklers.

1.7 DELIVERY, STORAGE AND HANDLING

A. Deliver acoustical ceiling units to project site in original, unopened packages and store them in a fully enclosed space where they will be protected against damage from moisture, direct sunlight, surface contamination, and other causes.

B. Before installing acoustical ceiling units, permit them to reach room temperature and a stabilized moisture content.

C. Handle acoustical ceiling units carefully to avoid chipping edges or damaged units in any way.

1.8 PROJECT CONDITIONS

A. Space Enclosure:

Standard Ceilings: Do not install interior ceilings until space is enclosed and weatherproof; wet work in place is completed and nominally dry; work above ceilings is complete; and ambient conditions of temperature and humidity are continuously maintained at values near those intended for final occupancy. Building areas to receive ceilings shall be free of construction dust and debris.

1.09 WARRANTY

A. Acoustical Panel: Submit a written warranty executed by the manufacturer, agreeing to repair or replace panels that fail within the warranty period. Failures include, but are not limited to the following:

1. Acoustical Panels: Sagging and warping

2. Grid System: Rusting and manufacturer's defects

B. Warranty Period:

1. Acoustical Metal panels: One (1) year from date of substantial completion

2. Grid: One (1) year from date of substantial completion

C. The Warranty shall not deprive the Owner of other rights the Owner may have under other provisions of the Contract Documents and will be in addition to and run concurrent with other warranties made by the Contractor under the requirements of the Contract Documents.

1.10 MAINTENANCE

A. Extra Materials: Deliver extra materials to Owner. Furnish extra materials described below that match products installed. Packaged with protective covering for storage and identified with appropriate labels.

1. Acoustical Metal Ceiling Units: Furnish quality of full-size units equal to 5.0 percent of amount installed.

2. Exposed Suspension System Components: Furnish quantity of each exposed suspension component equal to 2.0 percent of amount installed.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Metal Ceiling Panels:

1. Armstrong World Industries, Inc.

B. Suspension Systems:

1. Armstrong World Industries, Inc.

C. Aluminum Custom Trims:

1. Armstrong World Industries, Inc.

2.2.1 ACOUSTICAL CEILING UNITS

A. Acoustical Panels Type AMP

1. Acoustical Panels Type AMP-1:
   a. **Surface Texture: Smooth**
   b. Composition: Metal
   c. Color: To be selected by Architect
   d. Size: 4IN x 96IN
   e. Edge Profile: Linear

f. Perforation Option: Unperforated

g. Noise Reduction Coefficient(NRC):
h. Ceiling Attenuation Class (CAC) :
i. Sabin: N/A
j. Articulation Class (AC):
k. Flame Spread: ASTM E 1264; Class A (FM)
l. Light Reflectance White Panel:
m. Dimensional Stability: Standard
n. Recycle Content: Post-Consumer - 0% Pre-Consumer Waste - 25%
o. Acceptable Product: MetalWorks Linear, 5490 as manufactured by Armstrong World Industries

2. Infill Metal Panel Accessories:
1. 5497 - Standard Carrier

1. Acoustical Panels Type AMP-2:
a. **Surface Texture: Perforated**
b. Composition: Metal
c. Color: To be selected by Architect
d. Size: 4IN x 96IN
e. Edge Profile: Linear
f. Perforation Option: PERFORATED
g. Noise Reduction Coefficient(NRC):
h. Ceiling Attenuation Class (CAC) :
i. Sabin: N/A
j. Articulation Class (AC):
k. Flame Spread: ASTM E 1264; Class A (FM)
l. Light Reflectance White Panel:
m. Dimensional Stability: Standard
n. Recycle Content: Post-Consumer - 0% Pre-Consumer Waste - 25%
o. Acceptable Product: MetalWorks Linear, 5492 as manufactured by Armstrong World Industries

2. Infill Metal Panel Accessories:
1. 5497 - Standard Carrier

PART 3 - EXECUTION

3.1 EXAMINATION

A. Do not proceed with installation until all wet work such as concrete, terrazzo, plastering and painting has been completed and thoroughly dried out, unless expressly permitted by manufacturer's printed recommendations. (Exception: HumiGuard Max Ceilings)

3.2 PREPARATION

A. Measure each ceiling area and establish layout of acoustical units to balance border widths at opposite edges of each ceiling. Avoid use of less than half width units at borders, and comply with reflected ceiling plans. Coordinate panel layout with mechanical and electrical fixtures.

B. Coordination: Furnish layouts for preset inserts, clips, and other ceiling anchors whose installation is specified in other sections.

1. Furnish concrete inserts and similar devices to other trades for installation well in advance of time needed for coordination of other work.

3.3 INSTALLATION

A. Follow manufacturer installation instructions

B. Install suspension system and panels in accordance with the manufacturer's instructions, and in compliance with ASTM C 636 and with the authorities having jurisdiction.

C. Install wall moldings at intersection of suspended ceiling and vertical surfaces. Miter corners where wall moldings intersect or install corner caps.

D. For reveal edge panels: Cut and reveal or rabbet edges of ceiling panels at border areas and vertical surfaces.

E. Install acoustical panels in coordination with suspended system, with edges resting on flanges of main runner and cross tees. Cut and fit panels neatly against abutting surfaces. Support edges by wall moldings.

F. Install acoustical panels in coordination with suspended system, with edges resting on flanges of main runner and cross tees. Cut and fit panels neatly against abutting surfaces. Support edges by wall moldings.

3.4 ADJUSTING AND CLEANING

A. Replace damaged and broken panels.

B. Clean exposed surfaces of ceilings panels, including trim, edge moldings, and suspension members. Comply with manufacturer's instructions for cleaning and touch up of minor finish damage. Remove and replace work that cannot be successfully cleaned and repaired to permanently eliminate evidence of damage.

END OF SECTION

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. Section Includes:

1. Solid vinyl floor tile.

1.3 ACTION SUBMITTALS

A. Product Data: For each type of product.

B. Sustainable Design Submittals:

1. Product Data: For adhesives, indicating VOC content.
2. Laboratory Test Reports: For adhesives, indicating compliance with requirements for low-emitting materials.
3. Laboratory Test Reports: For flooring products, indicating compliance with requirements for low-emitting materials.

C. Shop Drawings: For each type of floor tile. Include floor tile layouts, edges, columns, doorways, enclosing partitions, etc.

1. Show details of special patterns.

D. Samples: Full-size units of each color and pattern of floor tile required.

E. Product Schedule: For floor tile: LVT

F. INFORMATIONAL SUBMITTALS

G. Qualification Data: For Installer.

1.4 CLOSEOUT SUBMITTALS

A. Maintenance Data: For each type of floor tile to include in maintenance manuals.

1.5 MAINTENANCE MATERIAL SUBMITTALS

A. Furnish extra materials that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.

1. Floor Tile: Furnish two (2) percent of each type, color, and pattern of floor tile installed.

1.6 QUALITY ASSURANCE

A. Installer Qualifications: A qualified installer with a minimum of 5 years commercial resilient flooring installation experience, and who employs workers for this Project who are competent in techniques required by manufacturer for floor tile installation and seaming method indicated.

1. Engage an installer who employs workers for this Project who are trained or certified by floor tile manufacturer for installation techniques required.

B. Mockups: Build mockups to verify selections made under Sample submittals and to demonstrate aesthetic effects and set quality standards for materials and execution.

1. Build mockups for floor tile including accessories.

a. Size: 2’ x 4’ panel

2. Approval of mockups does not constitute approval of deviations from the Contract Documents contained in mockups unless Architect specifically approves such deviations in writing.
3. Subject to compliance with requirements, approved mockups may become part of the completed Work if undisturbed at time of Substantial Completion.

1.7 DELIVERY, STORAGE, AND HANDLING

A. Store floor tile and installation materials in dry spaces protected from the weather, with ambient temperatures maintained within range recommended by manufacturer, but not less than 50 deg F (10 deg C) or more than 90 deg F (32 deg C). Store floor tiles on flat surfaces.

1.8 FIELD CONDITIONS

A. HVAC system should be operational and running for a minimum of 7 days prior to resilient tile installation and remain running after resilient tile installation.

B. Maintain ambient temperatures within range recommended by manufacturer, but not less than 65 deg F (18 deg C) or more than 85 deg F (29 deg C), in spaces to receive floor tile during the following time periods:

1. 48 hours before installation.
2. During installation.
3. Permanently after installation.

C. Close spaces to traffic during floor tile installation.

D. Close spaces to traffic, all heavy rolling loads, and point loads for 48 to 72 hours after floor tile installation.

E. Install floor tile after other finishing operations, including painting, have been completed.

1.9 WARRANTY

A. Special Warranty for Resilient Tile; Manufacturer agrees to repair or replace defective material within specified warranty period.

1. Warranty does not include installer's workmanship.
2. Resilient tile must be installed and maintained according to manufacturer's recommendations.
3. Warranty Period:
   a. Manufacturing Standard LVT Warranty: 15 years.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

A. Fire-Test-Response Characteristics: For resilient tile flooring, as determined by testing identical products according to ASTM E .

1. Critical Radiant Flux Classification: Class I, not less than 0.45 W/sq. cm.

2.2 SOLID VINYL FLOOR TILE

A. Basis-of-Design Product: Interface, Inc. See drawings for styles.

B. Tile Standard: ASTM F 1700.

1. Class: Class 111
2. Type: B

C. Overall Thickness: 4.5 mm.

D. Size: 9.845” x 39.38”

E. Color: See finish schedule

F. Installation: Ashlar

2.3 INSTALLATION MATERIALS

A. Trowel-able Leveling and Patching Compounds: Latex-modified, portland cement based or blended hydraulic-cement-based formulation provided or approved by floor tile manufacturer for applications indicated.

B. Adhesives: XL BRANDS HM99, High Moisture Adhesive

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine substrates, with Installer present, for compliance with requirements for maximum moisture content and other conditions affecting performance of the Work.

1. Verify that finishes of substrates comply with tolerances and other requirements specified in other Sections and that substrates are free of cracks, ridges, depressions, scale, and foreign deposits that might interfere with adhesion of floor tile.

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

3.2 PREPARATION

A. Prepare substrates according to floor tile manufacturer's written instructions to ensure adhesion of resilient products.

B. Concrete Substrates: Prepare according to ASTM F 710.

1. Verify that substrates are dry and free of curing compounds, sealers, and hardeners.
2. Remove substrate coatings and other substances that are incompatible with adhesives and that contain soap, wax, oil, or silicone, using mechanical methods recommended by floor tile manufacturer. Do not use solvents.
3. Alkalinity and Adhesion Testing: Perform tests recommended by floor tile manufacturer. Proceed with installation only after substrate alkalinity falls within range on pH scale recommended by manufacturer in writing, but not less than 5 or more than 10 pH.
4. Moisture Testing: Proceed with installation only after substrates pass testing according to floor tile manufacturer's written recommendations, but not less stringent than the following:
    a. Perform relative humidity test using in situ probes according to ASTM F 2170. Proceed with installation only after substrates are below 90 percent relative humidity level.

C. Fill cracks, holes, and depressions in substrates with trowel-able leveling and patching compound; remove bumps and ridges to produce a uniform and smooth substrate.

D. Do not install floor tiles until they are the same temperature as the space where they are to be installed.

1. At least 48 hours in advance of installation, move resilient floor tile and installation materials into spaces where they will be installed.

E. Immediately before installation, sweep and vacuum clean substrates to be covered by resilient floor tile.

3.3 FLOOR TILE INSTALLATION

A. Comply with manufacturer's written instructions for installing floor tile.

B. Lay out floor tiles from center marks established with principal walls, discounting minor offsets, so tiles at opposite edges of room are of equal width. Adjust as necessary to avoid using cut widths that equal less than one-half tile at perimeter.

1. Lay tiles in pattern indicated.

C. Match floor tiles for color and pattern by selecting tiles from cartons in the same sequence as manufactured and packaged, if so numbered. Discard broken, cracked, chipped, or deformed tiles.

1. Lay tiles with grain running in one direction.

D. Scribe, cut, and fit floor tiles to butt neatly and tightly to vertical surfaces and permanent fixtures including built-in furniture, cabinets, pipes, outlets, and door frames.

E. Extend floor tiles into toe spaces, door reveals, closets, and similar openings. Extend floor tiles to center of door openings.

F. Maintain reference markers, holes, and openings that are in place or marked for future cutting by repeating on floor tiles as marked on substrates. Use chalk or other nonpermanent marking device.

G. Install floor tiles on covers for telephone and electrical ducts, building expansion-joint covers, and similar items in finished floor areas. Maintain overall continuity of color and pattern between pieces of tile installed on covers and adjoining tiles. Tightly adhere tile edges to substrates that abut covers and to cover perimeters.

H. Adhere floor tiles to flooring substrates using a full spread of adhesive applied to substrate to produce a completed installation without open cracks, voids, raising and puckering at joints, telegraphing of adhesive spreader marks, and other surface imperfections.

3.4 CLEANING AND PROTECTION

A. Comply with manufacturer's written instructions for cleaning and protecting floor tile.

B. Perform the following operations immediately after completing floor tile installation:

1. Remove adhesive and other blemishes from exposed surfaces.
2. Sweep and vacuum surfaces thoroughly.
3. Damp-mop surfaces to remove marks and soil.

C. Protect floor tile from mars, marks, indentations, and other damage from construction operations and placement of equipment and fixtures during remainder of construction period.

D. Remove soil, adhesive, and blemishes from floor tile surfaces.

E. Cover floor tile until Substantial Completion.

END OF SECTION

PART 1 - GENERAL

1.01 SCOPE OF WORK

A. The furnishing of and paying for all labor, materials, services, appliances and equipment necessary for execution, installation and completion of all work specified herein and as shown on drawings.

B. Section includes:
   1. Resilient rubber base.
   2. Installation materials and adhesives required to complete installation of base specified herein.

1.02 SUBMITTALS

A. Submit under provisions of Section 01 3000.

B. Product Data: Provide data on specified products describing physical and performance characteristics and sizes.

C. Samples: Submit two samples illustrating color and pattern for each material specified for color selection by Architect.

1.03 PROJECT RECORD DOCUMENTS

A. Submit under provisions of Section 01 72000.

B. Submittals

1.04 PROJECT WARRANTIES, OPERATION AND MAINTENANCE DATA

A. Submit cleaning and maintenance data under provisions of Section 01 7250.

B. Include maintenance procedures, recommended maintenance materials, and suggested schedule for cleaning, stripping, and re-waxing.

1.05 DELIVERY, STORAGE AND HANDLING

A. Deliver, store, protect and handle products to site under provisions of Section 01 6000.

B. Deliver materials in original, unopened, protective packaging, with manufacturer's labels indicating brand name, pattern, size and thickness as applicable, legible and intact.

C. Do not begin installation until sufficient materials to complete a room are received.

D. Store material in a heated space protected from the weather and maintained at a temperature of 65 degrees F - 100 degrees F.

1.06 ENVIRONMENTAL REQUIREMENTS

A. Maintain the temperature of the space to receive the flooring and the materials to be installed at a minimum of 65 degrees F and maximum of 100 degrees F for at least 48 hours prior to, during, and 48 hours after installation. Maintain a minimum temperature of 55 degrees F thereafter.

1.07 EXTRA MATERIAL

A. Furnish under provisions of Section 01 7000.

B. Before acceptance, contractor is to deliver to the Owner two boxes (24 pieces) of each color of floor tile for the Owner's use in marked cartons.

PART 2 - PRODUCTS

2.01 MANUFACTURER AND MATERIAL - BASE

A. Equivalent to Armstrong Rubber Wall Base.

B. Base at areas to be standard cove base 4 inches high.

C. Color: See Drawings

2.02 ACCESSORIES

A. Reducer Strips: 1 inch wide, rubber, tapered to meet abutting materials.

B. Primers and Adhesives: As recommended by manufacturer of flooring material, for surface and use conditions required and to comply with manufacturer warranty requirements.

PART 3 - EXECUTION

3.01 EXAMINATION

A. Examine surfaces scheduled to receive flooring, stair treads and base for unevenness, irregularities and dampness that would affect quality and execution of work.

B. Areas to which base units will be cemented must be free of oils, form residue or materials that will affect bond capabilities of adhesive.

C. Beginning of installation means acceptance of substrate and site conditions.

3.02 PREPARATION

A. Fill all cracks, etc., with patch and trowel smooth. Apply vinyl patch to align tile vertically with adjacent floor finishes; feather to edge in 3 feet - 0 inches ±.

B. Apply, trowel, and float filler to leave a smooth, flat, hard surface.

C. Clean substrate.

D. Apply primer to surfaces as recommended by manufacturer.

3.03 INSTALLATION - BASE MATERIALS

A. Install base securely, completely around walls of all space specified and around bases of permanently installed casework, millwork and equipment, making a continuous base.

B. Miter internal corners. At external corners, use premolded units. At exposed ends use premolded units.

C. Install base on solid backing. Bond tight to wall and floor surfaces.

D. Scribe and fit to door frames and other interruptions.

3.04 PROTECTION OF WORK

A. Protect finished work under provisions of Section 01 5000.

B. Prohibit traffic on floor finish for 48 hours after installation.

END OF SECTION

PART 1 - GENERAL

1.01 SCOPE OF WORK

A. The furnishing of and paying for all labor, materials, services, appliances and equipment necessary for the execution, installation, and completion of all work as specified herein and as shown on drawings.

B. Section includes:
   1. Surface preparation, painting, staining, and varnishing of all items noted herein or as shown on drawings to be painted and all items normally painted including generally, but not limited to the following:
      a. New exterior metal work to match existing. Do not paint aluminum or stainless steel, unless specifically so noted to paint.
      b. New mill, galvanized, and bonderized metal, interior and exterior.
      c. New interior ferrous metal work such as grilles, rails, stair rails, door frames, doors, borrowed light frames, etc. Do not paint aluminum or stainless steel unless so noted.
      d. Exposed mechanical equipment (not factory finished painted) including duct, conduit, etc., except that located in mechanical rooms or that painted under Division 15 and 16 of these specifications.
      e New interior gypsum board.
      f. New metal doors.
      g. Other work shown, specified or normally painted.
      h. Protection of adjacent and surrounding materials and finishes over or adjacent to which this contractor shall apply his materials. This shall include covering, cleaning, etc., as may be required to assure no damage, disfiguration or staining of adjacent or existing finishes or materials.

1.02 REFERENCES

A. American Society for Testing and Material (ASTM)
   1. D16 - Definitions of Terms Relating to Paint, Varnish, Lacquer and Related Products.
   2. D2016 - Test Method for Moisture Content of Wood

1.03 SUBMITTALS

A. Submit under provisions of Section 01 3000.

B. Finish Schedule:
   1. All schedules shall be typewritten
   2. Provide Finish Schedule listing each finish by Finish Type in reference to Article 3.08 herein giving the following information:
      a. Manufacturer and type of product used
      b. Number of coats of material
      c. Luster
      d. Type of application

C. Product Data: Provide data on all finishing products and special coatings.

D. Samples: Submit paint manufacturer's "paint fan" illustrating range of colors available for each surface finishing product schedule for color selection.

1.04 PROJECT RECORD DOCUMENTS

A. Submit under provisions of Section 01 7200.

B. Submittals

1.05 QUALIFICATIONS (APPLICATOR)

A. Applicator: Company specializing in performing the work of this section with minimum 5 years documented experience.

B. Superintendence: This Applicator shall keep a qualified foreman (may be a working foreman), satisfactory to the Owner and Architect, on this work at all times while painting is in progress with this work as his sole duty.

C. Employees: Employ skilled mechanics to ensure the very best workmanship. Quality workmanship is required. Material to be applied by craftsmen experienced in the use of the specific product involved.

1.06 MOCKUPS

A. Provide mockup under provisions of Section 01 4000.

B. Before proceeding with any painting prepare and finish a sample room, complete or in part, as directed by the Owner and Architect. Finish all areas or items in accordance with the specification and in colors selected by the Owner and Architect. When approved by the Owner and Architect, they shall serve as a standard for workmanship, appearance and materials approved for similar areas or items throughout this project.

1.07 DELIVERY, STORAGE AND HANDLING

A. Deliver, store, protect and handle products to site under provision of Section 01 6000.

B. All materials used on the project shall be stored in a single place as designated. Such storage space shall be kept clean and all damage thereto or to its surroundings shall be made good by the subcontractor.

C. Store materials at minimum ambient temperature of 50 degrees F and a maximum of 90 degrees F, in well ventilated area, and as required by manufacturer's instructions.

D. All soiled or used rags, waste and trash must be removed from the building every night and every precaution taken to avoid the danger of fire.

E. Restrict storage to paint and related equipment. Comply with health and fire regulations.

F. Paint Material:
   1. Deliver paints and enamels ready-mixed to job site. All material must be delivered in their original containers with labels intact.

2. Container labeling to include manufacturer's name, type of paint, brand name, brand code, coverage, surface preparation, drying time, cleanup, color designation, and instructions for mixing and reducing.

1.08 ENVIRONMENTAL REQUIREMENTS

A. Provide continuous ventilation and heating facilities to maintain surface and ambient temperatures above 60 degrees F for 24 hours before, during, and 48 hours after application of finishes, unless required otherwise by manufacturer's instructions.

B. Do not apply exterior coatings during rain or snow, or when relative humidity is above 80 percent, unless required otherwise by manufacturer's instructions.

C. Contractor is to provide forced ventilation when painting within occupied spaces as necessary to prevent hazardous accumulations of dust, fumes, vapors or gases.

1.09 EXTRA MATERIAL

A. Furnish under provisions of Section 01 7000.

B. Provide a one gallon container of each color per building and surface texture to Owner.

C. Label each container with color, texture, and room locations in addition to the manufacturer's label.

PART 2 - PRODUCTS

2.01 MANUFACTURER - PAINT AND VARNISH

A. Sherwin-Williams

B. Farrell-Calhoun

C. Pratt and Lambert

D. ICI / Glidden

E. Substitution: Under provision of Section 01 6000

2.02 MANUFACTURER - ACCESSORIES MATERIAL

A. Thinners, Metal Surface Cleaners, Galvanized Treatment, Filling compounds, Turpentine and Primers - As recommended by paint manufacturer.

2.03 MATERIALS

A. Standards and Manufacturers (Painting)
1. All paint materials must be equal or exceed Federal Specifications or other standards herein under "Materials" in applicable categories.
2. Claims by the Contractor as to the unsuitability or unavailability of any materials specified or his inability to produce first-class results with same, will not be entertained unless such claims are made in writing prior to bidding.

3. All paint materials shall be applied in accord with manufacturer's directions or as specified herein. As there is a slight variation in the recommended procedures of different manufacturers, such minor variations shall be taken into account in considering or making any proposal of material change.

2.04 FINISHES

A. Refer to Schedule, Article 3.08.

PART 3 - EXECUTION

3.01 EXAMINATION

A. Verify that surfaces are ready to receive work as instructed by the product manufacturer.

B. Examine surfaces scheduled to be finished prior to commencement of work. Report any condition that may potentially affect proper application.

C. Test shop applied primer for compatibility with subsequent cover materials.

D. Examination includes bond, moisture, and alkali testing as required or recommended by manufacturer. Moisture meter readings of back surfaces shall be less than 4 percent.

E. Beginning of installation means acceptance of surfaces.

3.02 PREPARATION - NEW SURFACES

A. Remove electrical plates, hardware, light fixture trim, and fittings prior to preparing surfaces for finishing.

B. Correct minor defects and clean surfaces which affect work of this section.

C. Shellac and seal marks which may bleed through surface finishes.

D. Impervious Surfaces: Remove mildew by scrubbing with solution of tri-sodium phosphate and bleach. Rinse with clean water and allow surface to dry.

E. Gypsum Board Surfaces: Latex fill minor defects. Spot prime defects after repair.

F. Galvanized Surfaces: Remove surface contamination and oils and wash with solvent. Apply coat of etching primer.

G. Unit Masonry Surfaces Scheduled to Receive Paint Finish: Remove dirt, loose mortar, scale, salt or alkali powder, and other foreign matter. Remove oil and grease with a solution of tri-sodium phosphate; rinse well and allow to dry. Remove stains caused by weathering of corroding metals with a solution of sodium metasilicate after thoroughly wetting with water. Allow to dry.

H. Uncoated Steel and Iron Surfaces: Remove grease, scale, dirt, and rust. Where heavy coatings of scale are evident, remove by wire brushing or sandblasting; clean by washing with solvent. Apply a treatment of phosphoric acid solution, ensuring weld joints, bolts, and nuts are similarly cleaned. Spot prime paint after repairs.

I. Shop Primed Steel Surfaces:
   1. Several items to receive a painter's finish under this specification will be furnished with a prime coat of paint. It is this contractor's responsibility to determine this by a study of all sections of this specification. As an aid, however, these items are generally as follows:
      a. All structural and miscellaneous steel
      b. Stair handrails, railings, etc.
      c. Steel doors, frames and borrowed light frames
      d. Steel access doors
      e. Heating grilles and diffusers in wall surfaces to be painted
   2. All primed surfaces shall be cleaned, sanded, touched up, and washed with turpentine prior to painting.
   3. If primer has become badly abraded, damaged, or rust formed, sand smooth and apply one coat of primer specified herein before proceeding with paint application specified.
   4. Galvanizing or bonderizing is not considered a primer.

3.03 PROTECTION

A. This contractor is advised that he shall be totally responsible for protection of surfaces and finishes adjacent to or beneath his work to the extent that he shall totally clean or pay to have cleaned all surfaces, new or existing, damaged by his materials.

B. Concrete floors are finished floors and shall be totally covered and protected by this contractor during application of his materials within these areas. Extra care must be taken during this work, particularly during spray operation, to provide complete finished floor surfaces without splotches, stains, etc.

C. Furnish drop cloths, shields, and protective methods to prevent spray or droppings from disfiguring other surfaces.

3.04 APPLICATION

A. Apply products in accordance with manufacturer's instructions.

B. All applications to be with brush or roller unless noted otherwise. Use proper roller or brush for application. Brush apply only all varnish. Reference paint finish specifications for more detail.

C. All material shall be evenly applied so as to be free from sags, runs, crawls, or other defects. All coats shall be of proper consistency and well brushed to show the minimum of brush marks, except lacquer and enamel which shall be uniformly flowed, or sprayed. All brushes shall be clean and in good condition.

D. The word "exposed" as used herein means exposed to normal view after completion of total construction. Does not include mechanical equipment ducts, etc. in equipment or mechanical rooms.

E. No work shall be done under conditions that are unsuitable for the production of good results.

F. All coats shall be thoroughly dry before the succeeding coat is applied. Allow at least 24 hrs. between coats, unless special paint is used that requires more or less time for drying.

G. Painting coats as specified are intended to cover surface perfectly. If surfaces are not covered, further coats shall be applied without cost to the Owner.

H. While the painting is being done, the building shall be closed and broom cleaned. Do not paint any area while dust conditions exist in that area, or under conditions of inadequate light.

I. The undercoats of paint and enamel shall be tinted to approximate shade of the final coat.

J. All finishes shall be uniform as to sheen, color and texture.

K. All materials shall be evenly spread and smooth flowed on without runs or sags.

L. All surfaces to be painted shall be cleaned free of loose dirt by brushing or wiping and wiping with a cloth after each sanding before painting.

M. Sand and wool all surfaces prior to painting and lightly sand and wool between all coats to produce smooth surface.

N. Do not paint damp, moist or uncured surfaces, use moisture meter to determine suitability.

O. This contractor shall furnish and place drop cloths for protection of finished floor and other finished work from damage during progress of the work. The contractor shall be responsible for damage caused by him. Reference Article 3.03 Protection above herein.

P. Where fluid unavoidably contacts glass, hardware, or other finished surfaces, it shall be immediately removed while moist.

Q. Where fluid solder flux has been used on metal work, clean thoroughly with benzene before further application.

R. Unprimed steel shall be primed immediately upon delivery to the site.

3.05 CLEANING

A. As work proceeds, promptly remove paint where spilled, splashed or spattered.

B. During progress of work, maintain premises free of unnecessary accumulation of tools, equipment, surplus materials and debris.

C. Collect cotton waste, cloths and material which may constitute a fire hazard; place in closed metal containers and remove daily from site.

D. Inspect all surfaces for skips, blemishes or imperfections. Repaint or repair as required to first class appearance.

E. Clean all adjacent surfaces, hardware, and accessory items damaged by this work. Replace if damage cannot be repaired.

F. Remove all debris from the work site.

3.06 PROTECTION OF FINISH WORK

A. Protect finished work under provisions of Section 01 5000.

3.07 DETERMINATION OF FINISHES

A. To determine the required types of painter's finish for various areas and surfaces, this contractor shall review the following:
   1. Paint finish or specified numbers on the Room Finish Schedule.
   2. Paint finish or specified numbers on the Door schedule.
   3. The general title designation of material covered under each paint finish description herein.
   4. Example: Paint Finish No. I-1 (interior gypsum board)
      1 coat, etc.
      1 coat etc.
      Indicates that all interior gypsum board receives this finish unless schedules are noted otherwise. If the room finish schedule carries the notation "NONE", this area or surface receives no painter's finish.

3.08 PAINT FINISH TYPES

A. Interior:
   1. Paint Finish I-1 - New Interior Gypsum Board:
      1st Coat – Sherwin Williams Latex Wall Primer B28W200
      2nd Coat – Sherwin Williams Promar 400 Latex Semi-Gloss Enamel
      3rd Coat – Sherwin Williams Promar 400 Latex Semi-Gloss Enamel
   2. Paint Finish I-2 - New Interior Gypsum Board Ceilings:
      1st Coat – Sherwin Williams Latex Wall Primer B28W200
      2nd Coat – Sherwin Williams Promar 400 Latex Enamel (flat)
      3rd Coat – Sherwin Williams Promar 400 Latex Enamel (flat)
   3. Paint Finish I-3 – Exposed Roof Deck, Bar Joists, Ductwork, Sprinkler Piping, Water Piping, Gas Piping, and all exposed electrical conduit:
      Treat galvanized surfaces. Remove all grease and foreign materials prior to painting.
      Two coats (to cover) Sherwin Williams Waterborne Acrylic Dryfall (Flat)
   4. Paint Finish I-4 – Metal Work including Doors, Frames, Handrails, Trim, etc.
      Factory or shop primed items (Reference Article 3.02):
      1st Coat – Sherwin Williams Universal Primer B50NZ (touch up only)
      2nd Coat – Sherwin Williams Alkyd Semi-Gloss Enamel B34W200 Series
      3rd Coat – Sherwin Williams Alkyd Semi-Gloss Enamel B34W200 Series
   5. Paint Finish I-5 - Wood Stained:
      1st Coat – Sherwin Williams A49N00202- Wood Classics Interior Oil Stain
      2nd Coat – Sherwin Williams A67F00001 - Wood Classics Polyurethane Varnish Hand Rubbed
      (Satin Clear)
      3rd Coat – Sherwin Williams A67F00001 - Wood Classics Polyurethane Varnish Hand Rubbed
      (Satin Clear)
   6. Paint Finish I-6 - New Concrete Block
      1st Coat – Sherwin Williams PrepRite Block Filler
      2nd Coat – Sherwin Williams Promar 400 Latex Semi-Gloss Enamel
      3rd Coat – Sherwin Williams Promar 400 Latex Semi-Gloss Enamel
   7. Paint Finish I-7 – New Concrete Block-Epoxy
      1st Coat – Block Filler: Sherwin Williams Loxon Block Surfacer (A24W200)
      2nd Coat – Sherwin Williams Water Based Catalyzed Epoxy (B70 Series)
      3rd Coat – Sherwin Williams Water Based Catalyzed Epoxy (B70 Series)

B. Exterior:

1. Paint Finish E-1 - All Exposed Exterior Metal Work on building and on roof including hollow metal doors, frames, windows, frames and miscellaneous metal items such as lintels, trim, roof metal galvanized flashing, etc. (Do not paint pre-finished metal roof, parapet caps, gutters, scuppers, heads and/or prefinished rooftop equipment.):
   1st Coat – Sherwin Williams Universal Primer B50NZ
   2nd Coat – Sherwin Williams Industrial Enamel Alkyd B54 Series
   3rd Coat – Sherwin Williams Industrial Enamel Alkyd B54 Series
   OR
   Factory or shop primed items (Reference Article 3.02):
   1st Coat – Sherwin Williams Universal Primer B50NZ (touch-up only)
   2nd Coat – Sherwin Williams Industrial Enamel Alkyd B54 Series (gloss)
   3rd Coat – Sherwin Williams Industrial Enamel Alkyd B54 Series (gloss)
   OR
   Galvanized metal items:
   1st Coat – Sherwin Williams Galvite B50W3
   2nd Coat – Sherwin Williams Industrial Enamel Alkyd B54 Series (gloss)
   3rd Coat – Sherwin Williams Industrial Enamel Alkyd B54 Series (gloss)
   Do not paint prefinished items.
2. Paint Finish E-2 - Exterior Pipe Bollards, Gutter Boots, etc.
   Factory or shop primed items (Reference Article 3.02.):
   1st Coat – Sherwin Williams Universal Primer B50NZ
   2nd Coat – Sherwin Williams Industrial Enamel Alkyd B54 Series (gloss)
   3rd Coat – Sherwin Williams Industrial Enamel Alkyd B54 Series (gloss)
3. Paint Finish E-3 - Roof-Top Piping:
   2 coats Sherwin Williams Silver-Brite Heavy Duty Rust Resistant Aluminum Paint (B5952)

END OF SECTION

PART 1 - GENERAL

1.01 SUMMARY

A. This Section includes the following:
   1. Fire extinguishers.

1.02 SUBMITTALS

A. Product data for cabinets include rough-in dimensions, details showing mounting methods, relationships of box and trim to surrounding construction, door hardware, cabinet type and materials, trim style, door construction, panel style, and materials.

1.03 QUALITY ASSURANCE

A. Single-Source Responsibility: Obtain extinguishers and cabinets from one source from a single manufacturer.

B. UL-Listed Products: Fire extinguishers shall be UL listed with UL listing mark for type, rating, and classification of extinguisher.

PART 2 - PRODUCTS

2.01 MANUFACTURERS

A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
   1. J. L. Industries.
   2. Larsen’s Manufacturing Co.
   3. Modern Metal Products.
   4. Potter-Roemer.
   5. Samson Products.

2.02 FIRE EXTINGUISHERS

A. General: Provide fire extinguishers for fire extinguisher and fire hose cabinets and other locations indicated, in colors and finishes selected by Architect-Engineer from manufacturer's standard, that comply with authorities having jurisdiction.

B. Multipurpose Dry Chemical Type: UL-rated 4-A:80-B:C, 5-lb nominal capacity, in enameled steel container.

C. At Kitchen, provide UL-rated, Class K, 2.5 gal nominal capacity, in stainless steel container.

2.03 MOUNTING BRACKETS (FE)

A. Brackets: Designed to prevent accidentally dislodging extinguisher, of sizes required for type and capacity of extinguisher indicated, in plated finish.
   1. Provide brackets for extinguishers not located in cabinets.

B. Identify bracket-mounted extinguishers with FIRE EXTINGUISHER in red letter decals applied to wall surface. Use letter size, style, and location as selected by Architect-Engineer.

PART 3 - EXECUTION

3.01 INSTALLATION

A. Follow manufacturer's printed instructions for installation.

B. Install in locations indicated with top of extinguishers at 4 feet above finished floor or at heights to comply with applicable regulations of governing authorities.
   1. Fasten mounting brackets to structure, square and plumb.

END OF SECTION

PART 1 - GENERAL

1.01 SCOPE OF WORK

A. Furnishing of and paying for all labor, materials, services, appliances and equipment necessary for execution, installation and completion of all work specified herein and as shown on Drawings.

B. Work included:
   1. Roll-formed aluminum overhead hanger rod style canopy system.
   2. Any and all accessories including trim members, cap flashing, closures, anchors, fasteners, etc. as required to complete the above work in a watertight first class workmanship manner.
   3. Furnish and install all caulking and/or sealants to render a complete watertight system.

1.02 PERFORMANCE REQUIREMENTS

A. Load Requirements:
   1. The system shall be designed to meet a Live Load requirement of 20 PSF, a Wind Up-Lift Load of 130 PSF, and the roll-formed aluminum canopy system shall be able to withstand concentrated loads at any point such as walking on top.

1.03 DESIGN RESPONSIBILITY

A. Design drawings or graphic design of the aluminum canopy system shall be submitted for approval. All drawings shall be stamped by a Structural and/or Civil Engineer registered in the State of Arkansas This engineer shall remain fully responsible for the design of the aluminum canopy system and the integrity of the structure prior to fabrication of any materials.

B. Be responsible for the exact technical detailing and successful performance of the aluminum canopy system in its entirety including its proper working relationship with adjacent materials and systems. Confirm all dimensions relative to their elements of construction. Notify the Designer of any dimensions which are in variance with those shown in the contract drawings. Modifications of the aluminum canopy system dimensions will be made as required to accommodate other elements of construction after review by the Designer.

C. Be responsible for supplementing the general design which has been drawn and specified with complete engineering data for the Designer's review. By offering a bid and accepting the Contract, the Contractor agrees that the information contained in the Contract Documents is adequate to allow him to properly fabricate and erect the system specified herein.

1.04 SUBMITTALS

A. Submit shop drawings and product data under provisions of Section 01300.

B. Indicate on shop drawings, system and component dimensions; components within assembly; framed opening requirements and tolerances; anchorage and fasteners, drainage and flashing details, column layout and roof framing plans, and roof sections and details. Contractor to verify all dimensions and elevations.

1.05 PROJECT RECORD DOCUMENTS

A. Submit under General Provisions.

B. Submittals

1.06 PROJECT WARRANTIES, OPERATION AND MAINTENANCE DATA

A. Comply with the General Provisions.

B. Warranty (Article 1.09)

1.07 QUALIFICATIONS

A. Applicator: Company specializing in performing the work of this Section with a minimum of five years documented experience and certified approved applicator by the manufacturer.

1.08 DELIVERY, STORAGE, AND HANDLING

A. Deliver, store, protect and handle all products to site until ready for use. Deliver materials in sufficient quantity to allow continuity of work. Do not stack in concentrated area of roof.

B. Store metal roofing system, insulation and other materials on clean raised platforms with weather protective covering when stored outdoors. Provide continuous protection of materials against wetting and moisture absorption. Protect materials against damage by construction traffic.

C. Care should be taken to prevent contact with any substance which may cause a discoloration in the finish during storage:

D. Remove wet or damaged materials from project site immediately. Do not use.

1.09 WARRANTY

A. Provide applicator's written warranty one year from the date of project Substantial Completion guaranteeing materials and workmanship for water-tightness, weather-tightness, and against all leaks. During the one year period, the installer shall repair all leaks without cost to the Owner.

B. Furnish the Owner with the aluminum canopy system manufacturer's written extended standard limited 5 year warranty on the fluorpolymer coating, warranting against peeling, blistering, chalking, checking, crazing and fading for 5 years. Warranty to be non-prorated and is to include material and replacement cost.

C. Warranties are to begin at the date of project Certificate of Substantial Completion.

PART 2 - PRODUCTS

2.01 MANUFACTURER

A. Aluminum canopies shall be a Super Lumideck Extruded aluminum overhead hanger rod assembly style canopy system as manufactured by Mapes Industries, Inc., Lincoln, Nebraska (800.228.2391) or approved equivalent as indicated on drawings.

2.02 MATERIALS

A. Decking shall consist of 2 ¾" Extruded Aluminum .078 interlocking decking perpendicular to wall.

B. Intermediate framing members shall be extruded aluminum, alloy 6063-T6.

C. 1" by Schedule 40 hanger rod system assembly and attachment hardware shall be powder coated to match canopy with steel escutcheon plates at wall as indicated on Drawings.

D. Fascia shall be standard 8 extruded "G" style.

2.03 FINISHES

A. Standard factory clear anodized.

2.04 FABRICATION

A. All connections shall be mechanically assembled utilizing 3/16 fasteners with a minimum shear stress of 350 lb. Pre-welded or factory-welded connections are not acceptable.

B. Decking shall be designed with interlocking extruded aluminum members with mechanical fasteners field applied to provide structural integrity for the completed system.

C. Concealed drainage. Water shall drain from covered surfaces into intermediate trough and be directed to the front for front drainage.

PART 3 - EXECUTION

3.01 INSPECTION

A. Check areas to receive Protective Cover for correct height, width and spacing of support structures that may affect quality and execution of work.

B. Commence installation of all items when all checks have been made.

C. Start of work constitutes acceptance of job conditions.

3.02 ERECTION

A. Erection shall be performed by manufacturer approved erectors and shall be scheduled after all concrete, masonry, and roofing work in the vicinity is complete and cleaned. Anchor bolts shall be furnished by the manufacturer and installed by the General Contractor to the dimensions and elevations shown on the approved shop drawings.

B. Extreme care shall be taken to prevent damage to the structure and its finish. All extruded canopy systems shall be installed plumb and level as shown on the approved shop drawings.

3.03 FLASHING

A. Any and all flashing to other construction shall be furnished and installed by this contractor.

3.04 CLEANING

A. Clean aluminum surfaces.

B. Remove debris from work site.

END OF SECTION

PART 1 - GENERAL

1.01 SUBMITTALS

A. Product Data: Submit data to illustrate each accessory at large scale and show installation method.

B. Installation Instruction: Submit printed manufacturer's installation instruction.

1.02 SYSTEM DESCRIPTION

A. Conform to requirements of ANSI A117.1 – Specifications or Making Building and Facilities Accessible To and Usable By Physical Handicapped People.

B. Conform to requirements of American Disabilities Act.

1.03 KEYING

A. Supply keys for each accessory to Owner. Master key all accessories.

PART 2 - PRODUCTS

2.01 TOLIET ACCESSORIES

A. Manufacturer/Product:

Bobrick Washroom Equipment Inc.; Products as specified.

B. Grab Bar (side wall): Model B-6106 x 42; 1-1/2 inch diameter; stainless steel; stain finish.

C. Grab Bar (rear wall): Model B-6106 x 36; 1-1/2 inch diameter; stainless steel; stain finish.

D. Mirror: Model B-165; 24 inches wide x 48 inches high; thief resistant channel-frame mirror.

E. Shower Rod: Model B-6047 - 60 inches, heavy duty.

PART 3 - EXECUTION

3.01 EXAMINATION/PREPARATION

A. Deliver inserts and rough-in frames to jobsite at appropriate time for building-in. Provide templates and rough-in measurements as required.

B. Before starting work notify Architect in writing of any conflicts detrimental to installation or operation of units.

C. Verify with Architect exact location of accessories.

3.02 INSTALLATION

A. Install accessories and items in accordance with manufacturer's instructions.

B. Install units at mounting heights in conformance with ANSI A117.1 and ADA.

C. Install true, plumb, and level, securely and rigidly anchored to substrate.

D. Use temper-proof fasteners.

END OF SECTION

PART 1 – GENERAL

SUMMARY

A. This Section includes the following:
   1. Kitchen Exhaust Hood

SUBMITTALS

A. Submit product data and shop drawings on packaged exhaust hood.

PART 2 – PRODUCTS

2.1 GENERAL

A. Pre-Engineered fire suppression hoods shall be Denlar D1036-R Series.
B. Hood system shall be installed as UL300A compliant
B. NFPA 101 compliance is an available option on the Denlar D1036-R
C. The Hood shall be operating at a minimum of 500 CFM when NFPA101 compliant.
D. The Hood shall be installed with an integral fire extinguishing system that is mechanically activated by heat.

2.2 STANDARDS OF CONSTRUCTION

A. Hood shall be constructed of 18 gauge minimum, 300 Series stainless steel outer shell.
B. Hood shall be 36 inches wide.
C. Hood shall be manufactured and assembled with no visible outer welds or weld marks.
D. All internal seams shall be sealed with NSF-approved caulk, standard. A metal baffle filter shall be provided.
E. One (1) 60W Incandescent Shatterproof bulb or equivalent LED Hood light shall provide lighting on the range below.
F. The Hood shall integrate with the cooking equipment to deactivate the cooking equipment in the event of a discharge or system fault code.
G. Kitchen ventilation Hood shall be recirculating or exhaust only and cover a domestic range in commercial environments used for light duty cooking purposes only.
H. The Hood shall be ICC evaluated and certified as compliant with International Mechanical Code (IMC), International Fire Code (IFC), and Uniform Mechanical Code (UMC).
I. If provided with a fan, the fan shall be UL 507 listed or equivalent.
J. The Fire Suppression Hood shall be listed by ETL to the standards of the UL Subject 300A. Hood shall be configured as wall style (supplied with wall mounting bracket).
K. Hood shall include factory-installed UL Subject 300A fire suppression system, including environmental monitoring, wire rope, fail-safe fusible links and mechanical actuation. No electronic detection or actuation shall be accepted.
L. Fire suppression shall be a fail-safe, mechanical, method and consist of three fusible links 280º for 36”, temperature switches that monitor the cooking surface and upon reaching the first set-point, send a signal to turn the fan ON, at the second set point sends a signal to maintain the fan ON, while also sending a signal to shut OFF power to the range and sounding a local alarm. When the set point of the fusible links is reached, the tension on the actuator paddle releases pushing down on the actuator of the suppression tank; expelling the wet chemical agent from the pre-charged tank, a signal is sent to shut OFF power to the range and a local and building fire alarm (when connected) will be activated.
M. Tank pressure shall be monitored using tank pressure switch and a fault will cause the system alarm to sound and the LED status light will simultaneously flash four times. Pressure gauge indicating the tank pressure will be visible on the front of the hood. Mirrors to access the gauge shall not be acceptable.
N. All fire suppression and control components must be easily accessible by dropping the Hood into a service position to allow for service without removing the Hood from the wall. Thumb screws shall be utilized to hold the Hood into place for normal operation. No latches are acceptable.
O. Hood system shall be provided with an electric disconnect supplied with plug and play cable that will

shut down the power to the stove in the event of a system monitored condition occurring.
P. Fuel disconnect shall be field connected directly to the Hood via factory-provided plug and play cables. Prior to a fire suppression release, the shut off device shall be responsible for disabling the range upon detecting a high temperature.

Q. When governed by NFPA101 compliance Hood must include: a minimum of 500 CFM fan, interlocked (password protected) appliance disconnect with timed-automatic range deactivation and manual pull station.

1. Pull station shall be a mechanical pull station. Electronic pull station is not acceptable.
2. Password protected access will be mounted remotely. Hood mounted password access is not acceptable.

R. User controls shall be provided to control fan and lights. A Hood mounted touchscreen is not acceptable. The Hood or System status LED and audible alarm may be used to determine any faults within the system. All Hood controls must be accessed by switches and potentiometers on the Hood itself unless supplied with an ADA Switch with factory provided plug and play cable or controlled in conjunction with a touchscreen that is mounted remotely.

S. The Hood system shall be equipped with either a factory-supplied integral fan, factory-supplied external fan, or fan by others with manufacturer provided relay. Integral fan options include either front recirculating or rear discharge.

- Front recirculating style shall include an easily accessible charcoal filter and opening in the front of the Hood for filtering the exhaust air before discharging back into the space. Rear discharge style shall direct the air to exit the back of the hood, to discharge through a wall to the outside.
- External fan options include either a factory-provided inline fan (with plug and play cable), wall mount fan, roof fan or fan by others option with a top discharge Hood configuration. Top discharge style shall direct the air to exit the top of the hood, to discharge through a roof or wall to the outside. All factory provided fan options shall be listed to UL 507 standards.

T. Fire alarm dry contacts shall be provided.

U. Check, Test and Balance:

1. The kitchen exhaust system shall be inspected, tested and balanced by a qualified contractor. The contractor shall ensure proper and satisfactory operation of the kitchen exhaust system and shall provide a written and detailed report of this check, test and startup to the Engineer and Owner.

V. Warranty: Hood shall have a three-year product only warranty. Warranty does not include labor.

W. Provide a stainless-steel metal infill panel above hood to extend to the ceiling.

PART 3 - EXECUTION

3.1 GENERAL

A. The entire packaged kitchen exhaust hood shall be installed by qualified contractors meeting any licensing criteria in the jurisdiction they are installing.

END OF SECTION

1.00 GENERAL

1.01 SCOPE OF WORK

A. Provide all plastic laminate casework and accessory items as specified herein. Refer to plans for specific details and requirements.

B. General Conditions: The General Conditions, Supplementary General Conditions, Special Conditions, and General Requirements apply to all work in this Division.

1.02 RELATED WORK SPECIFIED ELSEWHERE

A. General millwork and custom cabinetry unless specified herein or so noted on plans as included within this section.

B. Rubber, vinyl or other finished toe base.

D. Blocking within walls.

E. Sinks, faucets, fittings, traps, stops, tail pieces, and other fixtures, electrical and mechanical runs and connections.

F. Fixture installation/services connections: Setting and installation of equipment and fixtures, and related utility connections, are provided under the other sections of the Project Specification governing that utility.

1.03 SUBMITTALS

A. Submit in accordance with General, Supplementary, and Special Conditions.

B. Submit shop drawings for approval in the form of electronic files. Show materials, dimensions, cabinet-cut details, and sink locations.

C. Samples of colors shall be submitted upon award of contract for selection and coordination with other suppliers. Architect may request and retain samples and catalog cuts as required for accessory and special items.

1.04 QUALIFICATIONS

A. Drawings and specifications are based upon casework by:

Varia, Inc.

Contact:	Garrett Vaughan
Phone:	615-557-7921
Email:	Garrett@goVaria.com

B. Casework of other manufacturers may be considered for approval provided a written statement of specification compliance, with request to bid, is received ten (10) days prior to opening of bids. Casework must conform to design, quality of materials, design intent, workmanship and exact performance function of casework components and details specified and implied by manufacturer's reference, and as shown on plans regardless of that manufacturer's "product standards".

C. Manufacturers requesting approval shall submit evidence of at least 5 years experience and installations for similar type of project. Full-sized samples, and specifications shall be submitted with written request along with detailed list of compliance and deviations from these documents for approval. Samples may be retained until completion of job for verification and compliance of specifications.

D. The following performance details are project requirements and must be met by all Bidders whether named herein, or approved by Addendum, regardless of that Manufacturer's "Standards".

1. Lamination: Doors, finished end panels, and other decorative exterior laminate surfaces shall be laminated exterior with .028 inch high-pressure plastic laminate, and interior with .020 inch high-pressure cabinet liner. Lamination with P.V.A. Type III water based adhesive (GREENGUARD certified).

2. Edging: All edging shall be glued to the core material using Polyurethane Reactive (PUR) hotmelt adhesive for superior bond and minimal glue line. Other hotmelt glues or contact adhesive are not acceptable.

3. Structural Cabinet Body: Cabinet backs shall be minimum 1/2 inch thick, inset from rear of body, and fully bound on four sides. Provide 3/4 inch thick stiffeners doweled into cabinet sides. Back shall be secured and sealed with full-perimeter high-strength hot-melt adhesive.

3. Cabinet Dimensions: All cabinets shall be provided in depth, widths and heights detailed on the drawings regardless of manufacturer's standard sizes. When "equal" cabinet sizes are detailed, custom widths shall be provided as required to achieve overall elevation dimensions. Fillers and scribes shall be limited to 1" unless detailed otherwise.

4. Shelf Loading: Shelves shall meet the loading/deflection standards of the National Particleboard Association.

5. Structural Drawer Body: Drawer body shall be doweled together with 1/2 inch bottom, recessed, fully bound and glued all four sides. Bottom reinforced with stiffeners in quantities as specified herein.

6. Drawer Suspension: Standard drawer slides shall be self-closing design, epoxy powder coated, with positive in-stop, out-stop, and out-keeper. Dynamic load rating shall be minimum 100 lbs. Minimum 150 lbs. static load rating. File cabinet drawer slides shall be full-extension.

7. Structural Cabinet Support: Cabinet sub-base shall be constructed of a separate exterior grade plywood to prevent moisture from wicking up into cabinet body. Plywood base shall be attached at the factory. Cabinet sides extending to the floor not allowed.

8. Fascia Panel: Fascia panel shall be integral with wall cabinet as noted in drawings.

F. Architect/Owners opinion and decision shall be final in the evaluation of manufacturer's products for approval to bid or award of contract.

2.00 PRODUCTS

2.01 MATERIALS

A. Laminated Plastics/Finishes:

1. High-pressure plastic laminate, .028 inch in thickness, for exterior surfaces shall meet NEMA LD3-2000 VGS standards. TFL, melamine or similar products not acceptable as VGS high-pressure laminate.

2. Exterior Color Selection Available:

a. Standard finish from casework manufacturer's standard stock colors consisting of wood grain, patterns and solid colors by Wilsonart or Formica unless indicated otherwise in the finish schedule or on the drawings.

b. Direction of wood grain shall be vertical on door fronts, drawer fronts, false fronts, kneespace panels, end panels, fascia panels, and exposed backs; horizontal grain on kneespace aprons and table frames unless detailed otherwise.

3. Plastic Laminate Balancing Sheet: White high-pressure cabinet-liner, .020 inch in thickness shall meet NEMA LD3-2000 CLS standards and used for balancing exterior VGS laminates.

4. Countertop High-Pressure Plastic Laminate:

a. High-pressure plastic laminate, conforming to NEMA Standard LD3-2005 and ANSI A161.2-1998, shall be .048 inch thickness or .042 inch post-form grade.

b. Heavy gauge .020 brown backing sheet shall be provided for balanced construction.

c. Core material shall be 1" thick M-2 industrial particleboard core except at wet areas which require either M-2 moisture-resistant particleboard core or 1" thick plywood.

e. All countertop joints and backsplash joints shall be secured with tight-joint fasteners.

f. Colors shall be selected from manufacturer's non-premium stock laminates in standard finishes, patterns and colors unless indicated otherwise on finish schedule.

5. Pressure Fused Laminate:

a. Melamine resin impregnated, 85 gram PSM average, thermofused to core under pressure.

b. Shall meet NEMA LD3-2000 VGL standards and NEMA LD3-2000 CLS standards, except thickness.

c. White pressure fused laminate for cabinet interiors behind door and drawers only.

B. High Performance Core:

1. Shall be particleboard, medium density, M-2, of balanced 3-ply construction with moisture content not to exceed 8%. Particleboard shall conform to ANSI A208.1-1999.

2. Cabinet components shall be of the following minimum core thicknesses:

a. 1/2 inch: cabinet backs, and drawer bottoms.

b. 3/4 inch: drawer boxes, door and drawer face, base, wall, and tall cabinet tops and bottoms, cabinet sides, drawer spreaders, cabinet back rear hang-strips, structural dividers, exposed cabinet backs, and shelves of less than 30-inch span.

c. 1 inch: product-specific work surfaces, component parts and heavy-duty shelving where indicated.

C. Edging types. Provide one or more of the following in accordance with "Edging Locations":

1. Flat Edge PVC/ABS. .020 inch. Solid, high-impact, purified, color-thru, acid resistant PVC/ABS edging machine-applied with PUR hot melt adhesives, automatically trimmed face, back and corners for uniform appearance.

2. 3mm PVC/ABS. Solid, high-impact, purified, color-thru, acid resistant, pre-lamination primed edging, machine-applied with PUR hot melt adhesives, automatically trimmed, inside/outside length-radiused for uniform appearance, buffed and corner-radiused for consistent design.

3. All edge banding must be applied by use of a chemically bonded PUR adhesive. Traditional EVA bonded adhesives will not be acceptable.

D. Edging Locations. Provide the above specified edging types at the following locations, of the following colors:

1. Door/Drawer-Front edging shall be 3mm PVC/ABS selected from standard colors, color matched to standard laminates.

2. Cabinet body front-facing edge, including door/drawer front spacer rail: Flat edge .5mm PVC/ABS, color matched to door/drawer face unless detailed otherwise.

3. Front-facing edge of closed interior body components, interior dividers, shelf, and top edges of drawer body: Flat edge .5mm PVC/ABS to match adjacent interior surface color unless detailed otherwise.

4. Front edge of open cabinets shall be 3mm PVC.

E. Hardware

1. Hinges:

   a. Heavy duty, five knuckle 2 3/4 inch institutional type hinge shall meet ANSI/BHMA A156.9 Grade 1 requirements. Mill ground, hospital tip, Teflon coated tight pin feature with all edges eased. Hinge shall be full wrap around type .095 inch thick.

   b. One pair per door to 48 inch height, One and one-half pair over 48 inches in height. Hinge shall accommodate 3/4 inch thick laminated door and allow 270 degree swing.

   c. Finish shall be: Chrome epoxy powder coat

2. Pulls:

   a. Wire design (4 inches) in epoxy powder finish, brushed aluminum, chrome or brass.

3. Sliding Door Hardware:

   a. Frameless 1/4 inch glass sliding doors: double track rolling door assembly.

   b. Framed 13/16 inch thick stile and rail sliding doors top mounted track with dual roller hangers. Vertical adjustment for accurate alignment.

4. Drawer Slides:

   a. Standard Drawers: self-closing design, epoxy powder coated White, with positive in-stop, out-stop, and out-keeper to maintain drawer in 80% open position. Captive nylon rollers, front and rear. Minimum 100 lb dynamic load rating at 50,000 cycles. Full extension slides are available at all drawers if specified.

   b. File Drawers: Full extension, 3-part progressive opening slide, minimum 100 lb, zinc plated or epoxy coated at manufacturer's option.

   c. Provide body mounted rails for hanging file system for legal or letter size as indicated.

   d. Paper Storage Drawers: Full extension, 3-part progressive opening slide, minimum 100 lb zinc plated or epoxy coated.

5. Catches: Catch shall provide opening resistance in compliance with the Americans with Disabilities Act.

6. Grommets: Plastic grommets by Doug Mockett & Co. (size, quantity and location as shown).

F. Detailed Requirements for Cabinet Construction:

1. Sub-Base:

   a. Cabinet sub-base shall be separate (no cabinet body sides-to-floor), water resistant exterior grade plywood with concealed fastening to cabinet bottom. Sub-base shall be applied to cabinet at the factory.

   b. Sub-base at exposed cabinet end panels shall be recessed 1/4 inch from face of finished end, for flush installation of finished base material by other trades.

2. Cabinet Top and Bottom:

   a. Solid full sub-top shall be furnished for all base cabinets. Rails not acceptable.

   b. Exterior exposed wall cabinet bottoms shall be VGS high-pressure plastic laminate color matched to cabinet fronts or finished ends, balanced with high-pressure plastic laminate or cabinet-liner interior surface. Assembly devices shall be concealed on bottom side of wall cabinets.

3. Cabinet Ends:
   a. Holes drilled for adjustable shelves 1 1/4 inches (32 mm) on center.
   b. Exposed exterior cabinet ends shall be laminated with VGS high-pressure plastic laminate, balanced with high-pressure plastic laminate or cabinet-liner interior surface.
4. Fixed and Adjustable Shelves:
   a. Thickness shall be 3/4 inch at standard cabinetry, and 1 inch at heavy duty shelving where indicated.
5. Cabinet Backs:
   a. Cabinet back shall be let-in on both sides, top, and bottom, recessed from cabinet rear. Rear, unexposed, side of back shall be toe-nailed to cabinet body with mechanical fasteners and solidified with a continuous bead of industrial grade hot melt adhesive.
   b. Hang rails shall be located at rear of cabinet back and fastened to cabinet sides. Provide minimum of 1 at base, 2 at wall, and 3 at tall cabinets.
   c. Exposed exterior backs shall be high-pressure plastic laminate balanced with high-pressure plastic laminate or cabinet-liner.
6. Door and Drawer Fronts:
   a. Laminated door and drawer fronts shall be 3/4 inch thick for all hinged doors. Drawer fronts and hinged doors shall overlay the cabinet body. Maintain a maximum 1/8 inch reveal between pairs of doors, between door and drawer front, or between multiple drawer fronts within the cabinet.
7. Drawers:
   a. Drawer fronts shall be applied to separate drawer body component sub-front. Drawers shall be equipped with drawer front adjusters for alignment in field and permanently secured with pan-head washer style screws.
   b. Drawer sides shall be doweled and glued to receive front and back.
   c. Drawer bottom shall be let-in on front, sides, and back. Routing, in drawer body for bottom, shall receive glue. Reinforce drawer bottoms with 1/2 inch x 4 inch front-to-back intermediate underbody stiffeners. One stiffener at 24 inches, two at 36 inches, and four at 48 inches .
8. Door/Drawer Front Rail: Provide minimum 3/4 inch x 6 inch x full width cabinet body rails immediately behind all door/drawer and multiple drawer horizontal joints to maintain exact body dimensions, close off reveal, and be locator for lock strikes.
9. ADA, Americans with Disabilities Act Requirements: The following special requirements shall be met, where specifically indicated on architectural plans as "ADA", or by General Note. See drawings for additional information.

G. Craftsmanship:

1. All exposed vertical exterior cabinet surfaces shall be .028 inch high-pressure laminate, color as selected from manufacturer's standards. Laminate surface/balancing liner to core under controlled conditions by approved and regulated laminating methods to assure a premium lamination. Natural-setting hybrid P.V.A. Type II water resistant adhesives that cure through chemical reaction, containing no health or environmentally hazardous ingredients, are

required. Methods requiring heat are not allowed; "contact" methods of laminating are not allowed.

2. Cabinet parts shall be accurately machined and bored for premium grade quality joinery construction utilizing automatic machinery to insure consistent sizing of modular components. End panels shall be doweled to receive bottom and top.

3. Back panel shall be fully bound into, and recessed from the back of cabinet sides, top, and bottom to insure rigidity and a fully closed cabinet. Cabinet back shall be fastened for tight interior fit and sealed with full-perimeter high-strength hot-melt adhesive.

4. Drawer bottom shall be fully bound and glued into and recessed from the bottom of sides, back, and sub-front. Sides of drawer shall be doweled to receive drawer back and sub-front.

5. 3/4 inch thick hang rails shall be mechanically fastened to end panels of all wall, base, and tall cabinets for extra rigidity and to facilitate installation.

6. All cases shall be square, plumb, and true.

7. Provide removable or accessible back panels and closure panels for plumbing access at all sink cabinets, and where shown on drawings.

8. All banded edges shall be applied using chemically bonded PUR hotmelt adhesive. Traditional EVA adhesive shall not be acceptable in lieu of PUR.

3.00 EXECUTION

3.01 COORDINATION

A. Coordinate work of this Section with related work of other Sections as necessary to obtain proper installation of all items.

B. Verify site dimensions of cabinet locations in building prior to fabrication.

C. Very site conditions prior to delivery and installation of casework. Adhere to AWI standards for jobsite conditions.

3.02 INSTALLATION

A. Storage and Protection: Casework shall be protected in transit. Store under cover in a ventilated building not exposed to extreme temperature and humidity changes. Do not store or install casework in building until concrete, masonry, and drywall/plaster work is dry. Building humidity and temperature shall be stabilized.

B. Workmen: Install casework under the supervision of the manufacturer's representative with factory-trained mechanics certified by manufacturer.

C. Workmanship:

1. Erect casework straight, level and plumb and securely anchor in place. Scribe and closely fit to adjacent work. Cut and fit work around pipes, ducts, etc.

2. Install all items complete and adjust all moving parts to operate properly.

3. Leave surfaces clean and free from defects at time of final acceptance.

D. Guarantee: All materials shall be guaranteed for a period of 5 years from manufacturer's defects and workmanship.

E. Clean Up: Remove all cartons, debris, sawdust, scraps, etc., and leave spaces clean and all casework ready for Owner's use.

PART 1 GENERAL

1.1 RELATED SECTIONS

A. Section 061000 - Rough Carpentry; blocking.

B. Section 092500 - Gypsum Board Assemblies; blocking.

C. Section 095100 - Acoustical Ceilings.

D. Section 099000 - Paints and Coatings.

1.2 REFERENCES

A. ASTM International (ASTM):
1. ASTM E 21 - Standard Test Method for Elevated Temperature Tension Tests of Metallic Materials.
2. ASTM E 22 - Recommended Practice for Conducting Long Time High Temperature Tension Test of Metallic Materials.
3. ASTM G 21 - Standard Practice for Determining Resistance of Synthetic Polymeric Materials to Fungi.
4. ASTM G 22 - Standard Practice for Determining Resistance of Plastics to Bacteria.

B. National Fire Protection Association (NFPA):
1. NFPA 70 - National Electrical Code.
2. NFPA 701 - Fire Tests for Flame-Resistant Textiles and Films.

C. Underwriters Laboratories Inc. (UL).

1.3 SUBMITTALS

A. Submit under provisions of Section 013000.

B. Product Data: Submit manufacturer's product data sheets, including installation details, styles, material descriptions, profiles, features, finishes and operating instructions.
1. Preparation instructions and recommendations.
2. Storage and handling requirements and recommendations.
3. Mounting details and Installation methods.
4. Typical wiring diagrams if applicable.

C. Shop Drawings: Submit manufacturer's shop drawings, including plans, elevations, sections, product details and finishes, installation details, operational clearances, wiring diagrams if applicable, and relationship to adjacent work.

D. Window Treatment Schedule: Submit a schedule with same room designations indicated on the Drawings; including but not limited to opening sizes and key to typical mounting details.

E. Maintenance Data: Submit instructions and precautions for cleaning and maintenance, operating hardware and controls as applicable.

F. Selection Samples:
1. Frame and Component Finishes: Submit 2 sets of samples, representing manufacturer's standard range of finishes specified for aluminum.
2. Fabric: Submit 2 sets of samples, representing manufacturer's standard range of options for shade cloth.

G. Verification Samples:
1. Frame and Component Finishes: Submit 2 samples, representing actual finishes specified for aluminum.
2. Fabric: Submit 2 samples, representing actual products specified for shade cloth.

1.4 QUALITY ASSURANCE

A. Manufacturer's Qualifications: Engaged in manufacturing of products of similar type to that specified, with a minimum of 10 years successful experience.

B. Installer Qualifications: Minimum 2 years successful experience installing similar products.

C. Single Source Requirements: To the greatest extent possible, provide products specified in this section from a single manufacturer.

1.5 DELIVERY, STORAGE, AND HANDLING

A. Delivery: Deliver materials to site protected from damage.

B. Storage: Store materials in clean, dry area indoors in manufacturer's unopened packaging until ready for installation and in accordance with manufacturer's instructions. Store in a clean, dry area, laid flat to prevent sagging and twisting of packaging.

C. Handling: Protect materials and finish from damage during handling and installation.

1.6 PROJECT CONDITIONS, COORDINATION AND SEQUENCING

A. Maintain environmental conditions (temperature, humidity, and ventilation) within limits recommended by manufacturer for optimum results. Do not install products under environmental conditions outside manufacturer's recommended limits.
1. Building shall be enclosed; windows, frames and sills shall be installed and glazed.
2. Wet work shall be complete and dry.
3. Ceilings, window pockets, electrical and mechanical work above window covering shall be complete.

B. Conference: Convene a pre-installation conference to establish procedures to maintain optimum working conditions and to coordinate this work with related and adjacent work.

1.7 TYPE OF WARRANTY

A. Warranty:
1. Provide Limited lifetime warranty on all Bali®, Graber® and SWFcontract™ products sold by SWF or by an authorized dealer, other than the products listed below, which have the limited warranty periods as indicated:
2. Exterior solar shade products: Five years

1.8 EXTRA MATERIALS

A. Attic Stock: Provide two extra blinds of primary size used for Owner's replacement stock.

PART 2 PRODUCTS

2.1 MANUFACTURERS

A. Acceptable Manufacturer: SWFcontract, which is located at: 7549 Graber Rd.; Middleton, WI 53562-1096 ; Toll Free Tel: 800-327-9798; Email:request info (architectsolutions@swfcontract.com); Web:www.swfcontract.com

B. Requests for substitutions will be considered in accordance with provisions of Section 01600.

2.2 MANUALLY OPERATED SHADING SYSTEMS

A. Shading Systems: SWFcontract Manual Solar Shades as manufactured by SWFcontract.

B. Fabric: Flame retardant, fade and stain resistant, anti-microbial.
1. Fabric Style, Color Name, Color Number: As scheduled and indicated on Drawings.

C. Components: Fabricate such that shade hangs flat without buckling or distortion.
1. TruePerformance Clutch Systems:
a. Clutch System: TruePerformance Clutch System from SWFcontract consisting of fiberglass filled nylon for wear resistance, smooth operation and corrosion resistance. The clutch is comprised Velvetrol internal spring arrangement for a smooth pulling force that locks the shade in any position when operating the control loop. The clutch mechanism is bi-directional and does not require adjustment or lubrication. Clutch to be factory installed in roller tube at manufacturing. Clutch size to be selected by manufacturer based on fabric selection and shade size.
2. Control Loops: Bead stops attached to the chain protect shade from over rotation.
a. Materials: Standard, No. 10 stainless steel bead chain.
3. Roller Tubes: Extruded-aluminum tubes engineered with a chamfered channel to accept fabric spline and allow fabric to lay across the tube without adding crease lines. The diameter and wall thickness to be determined by manufacturer based on fabric selection and shade size to provide minimal deflection and optimal performance.
4. Idler Ends: high strength, fiberglass-filled nylon with spring-loaded pin-end technology
5. Lift Assist Systems: Heavy-duty torsion spring located inside the roller tube. The mechanism reduces the pull force allowing easy lifting of larger shades.
6. Spline Systems: Consist of PVC spline heat-welded to the shade fabric and inserted into a channel on the roller tube. Tape and other methods of attachment are not acceptable.
7. Hem Bars: Standard, aluminum extrusion enclosed in a fabric hem pocket with heat-welded seams and ends, to coordinate with shade cloth selection.

D. Accessories:
1. Shade Pockets: Manufacturer shall provide appropriate dimensional pocket as necessary to enclose roller tube and fabric.
a. Finish: To be determined by Architect.
2. Closure Plates: Exposed, flush mounted, powder-coated extruded 6065-aluminum alloy designed to provide access to shades when recessed in ceiling.
a. Closure Mounts: With a lip.
b. Plate Size: 3 inches (76 mm).
c. Finish: To be determined by Architect

PART 3 EXECUTION

3.1 PREPARATION

A. Inspect mounting surfaces, blocking for shade brackets or pocket assemblies, suspended acoustical or gypsum ceiling for recessed shades and verify field measurements. Prepare

substrates using the methods recommended by the manufacturer for achieving the best result for the substrate under the project conditions.

B. Do not proceed with installation until substrates have been prepared using the methods recommended by the manufacturer and deviations from manufacturer's recommended tolerances are corrected. Commencement of installation constitutes acceptance of conditions.

C. If preparation is the responsibility of another installer, notify Architect in writing of deviations from manufacturer's recommended installation tolerances and conditions.

3.2 INSTALLATION

A. Install window treatments in accordance with manufacturer's instructions including the following.
   1. Install with adequate clearance to permit smooth operation of the shades throughout entire operational range.
   2. Adjust and balance window coverings to operate smoothly, easily, safely, and free from binding or malfunction throughout entire operational range.

3.3 CLEANING AND PROTECTION

A. Clean surfaces after installation in accordance with manufacturer's written instructions. Do not use cleaning methods involving heat, bleach, abrasives, or solvents.

B. Protect installed products until completion of project. Repair damaged or improperly installed before Substantial Completion.

END OF SECTION

PART 1 - GENERAL

1.01 SCOPE OF WORK

A. Furnishing of and paying for labor, materials, services, equipment and appliances required for termite treatment of earth specified herein.

1.02 SECTION INCLUDES

A. Soil treatment below slabs-on-grade for subterranean insects.

B. Soil treatment at interior and exterior foundations perimeter, for subterranean insects.

1.03 REFERENCES

A. Environmental Protection Agency (EPA) - Federal Insecticide, Fungicide and Rodenticide Act.

1.04 SUBMITTALS

A. Submit under provisions of Section 01 3000.

B. Product Data: Indicate toxicants to be used, composition by percentage, dilution schedule, and intended application rate.

C. Manufacturer's Certificates:
1. Certify that toxicants meet or exceed specified requirements.
2. Certify that toxicants conform to specified requirements of authority having jurisdiction.

1.05 PROJECT RECORD DOCUMENTS

A. Submit under provisions of Section 01 7200.

B. Submittals and Certifications

1.06 PROJECT WARRANTIES, OPERATION AND MAINTENANCE DATA

A. Submit documents under provisions of Section 01 7250.

B. Warranty (Article 1.09)

1.07 QUALIFICATIONS

A. Applicator: Company specializing in soil treatment for termite control with 5 years documented experience and licensed by the State of Arkansas.

1.08 REGULATORY REQUIREMENTS

A. Conform to State of Arkansas requirements for application licensing and authority to use toxicant chemicals.

1.09 WARRANTY

A. Provide one year minimum warranty which is to begin at the date of the project Certificate of Substantial Completion.

B. Warranty: Include coverage for damage and repair to building and building contents caused by termites. Repair damage. Retreat where required.

PART 2 - PRODUCTS

2.01 MATERIALS

A. Soil treatment materials which bear federal registraition number of U.S. Environmental Protection Agency and acceptable to authorities having jurisdiction. If acceptable, products may include chloropyrifos, ermathrin, cypermethrine, fenvalerate, isofenphose.

B. The termite treatment company shall be the same company the City has a contract with.

PART 3 - EXECUTION

3.01 EXAMINATION

A. Verify site conditions under provision of Section 01 3900.

B. Verify the soil surfaces are unfrozen, sufficiently dry to absorb toxicant, ready to receive treatment.

C. Beginning of application means acceptance of soil conditions.

3.02 APPLICATION

A. Spray apply toxicant in accordance with manufacturer's instructions.

B. Apply an overall treatment to entire surface of soil to be covered by the floor slab prior to installation of vapor barrier at a rate of 1-1/2 gallons per 10 sq. ft. In addition, apply 2 gallons per 5 lin. ft. to soil at critical areas such as along inside of foundation walls, at expansion and control joints, and around plumbing, utility services, and other features that will penetrate the slab.

C. After completion of grading, an application shall be made by rodding around the slab perimeter. Apply 2 gallons of emulsion per 5 lin. ft. per footing depth. Rod holes should not extend below top of footing. Do not apply to top soil.

3.03 RETREATMENT

A. If inspection identified the presence of termites, retreat soil and retest.

B. Use same toxicant as for original treatment.

3.04 CLEANING

A. Upon completion of the work of this section, remove from the premises all debris relating to the conduct of this portion of the work.

END OF SECTION

PART 1 GENERAL

1.01 SCOPE OF WORK

A. Furnishing of and paying for all labor, materials, services, equipment and appliances necessary for the execution, installation and completion of all work indicated on the drawings and specified herein.

B. Section Includes:
   1. Exterior Cast-In-Place Sitework Concrete, exterior to building structural concrete (Section 03 3010), including accessories for and items incidental thereto as required for completion of exterior concrete work or required. Exterior sitework concrete generally includes but not necessarily limited to concrete curbs, concrete canopies, steps, gutters, walks, ramps, drives and pads referenced herein. Concrete Paving shall comply with ArDOT Standard Specifications Section 501 and applicable standard drawings.
   2. All formwork for all exterior sitework concrete including all accessory items, framing and devices required to complete this work.
   3. All reinforcing steel, welded wire mesh and accessories required to support same.
   4. Concrete finishing, curing and protection.
   5. Install only, in accord with drawings provided, embedded type anchors, railing sleeves, stair nosings, and other embedded items for use of other sections of this specification. Drawings and devices will be provided by the using section showing proper location and installation. Reference specific sections of specifications. Reference Section 01 3900, 05 1000 and 05 5000.
   6. Division 23 and 26 Contractors will be required to furnish and install all exterior concrete equipment pads, culverts, drainage sumps, drainage inlets, etc. as shown on the drawings and specified in their specific section of the specifications. Such concrete work shall be constructed in accord with this section of the specifications. Exterior sitework concrete other than Division 23 and 26 work will be completed by Section 32 1313.
   7. Exterior sitework concrete work not specifically described otherwise on the plans or in the specifications is to comply with this section of the specifications.

1.02 REFERENCES

A. All CIP concrete work shall conform to the American Concrete Institute "Specifications for Structural Concrete for Buildings" ACI 301-89 including reference standards in Section 1.4 thereof except as modified by requirements specified herein or as noted on the Structural Drawings.

B. A copy of ACI SP-15 (84) "Field Reference Manual" which includes ACI 301 and reference standards specified therein shall be kept at the jobsite for ready reference.

C. ACI 318-89 Building Code Requirements for Reinforced Concrete.

D. ACI 117-81 Standard: "Standard Tolerances for Concrete Construction and Materials" except as modified by requirements specified herein.

E. ACI Manual of Concrete Practice and included reference standards noted herein.

F. American Society of Testing and Materials (ASTM): Standards noted in ACI 301 or noted herein, current edition.

1. C33 - Concrete Aggregates
2. C42 - Obtaining and Testing Drilled Cores and Sawed Beams of Concrete
3. C260 - Air-Entraining Admixtures for Concrete
4. D1751 - Preformed Expansion Joint Filler for Concrete Paving and Structural Construction (Nonextruding and Resilient Bituminous Types)

G. ACI Manual of Concrete Inspection (ACI 311.1R-81).

H. CRSI MSP-2-81: "Manual of Standard Practice," CRSI 63 Recommended Practice for placing reinforcing bars, and CRSI 65 Recommended Practice for placing bar supports.

I. ANSI/AWS D1.4 Structural Welding Code Reinforcing Steel.

J. ACI 347 Recommended Practice for Concrete Formwork.

K. PS-1 - Construction and Industrial Plywood.

L. National Ready Mix Concrete Association, QC Method - Plant Certification.

1.03 SUBMITTALS

A. Submit under provisions of Section 01 3000.

B. Product Data: Provide data on non-slip aggregates, joint filler, admixtures and curing compounds.

1.04 PROJECT RECORD DOCUMENTS

A. Submit under provisions of Section 01 7200.

B. Submittals

C. Test Reports

1.05 QUALITY ASSURANCE

A. It is the responsibility of the Contractor to maintain an adequate program of quality control for the materials, production methods, and workmanship to assure conformance of all work to the project contract documents.

B. All materials, equipment, and methods shall be subject to verification inspections and/or testing by the Owner's agents as specified herein.

C. Testing Laboratory Services: Conform to the provisions of Section 01 4325 and the requirements of Section 03 3010.

D. The Architect and Testing Laboratory are to have free access to all points where concrete materials are stored, proportioned, mixed or placed. All materials, equipment and methods shall be subject to inspections and/or testing by the Owner's agents.

E. Enforcement of Strength Requirements:
1. Concrete compression strength test results are to be evaluated in accordance with ACI-301, Chapters 17 and 18, and ACI-214. Should the average strength determined by the "Control" cylinders fall below the required overdesign strength, the necessary changes in

the design mix shall be made in accordance with ACI-301, Para. 3.8.2.3. Should the strength indicated by the "field" test cylinders fall below nominal strength, additional curing of those portions represented will be required. In the event that such additional curing will not give the strength required or in other cases where due to faulty workmanship the strength is in doubt, load tests conforming to ACI-318-89, Chapter 20, ACI Building Code or core samples (ASTM C42) will be required as appropriate to determine the adequacy of the members in question. Should these tests show that the strength and/or durability of the structural members is inadequate, strengthening or replacement will be required. All of the above requirements are to be fulfilled at the Contractor's expense.

1.06 DELIVERY, STORAGE, AND HANDLING

A. Deliver, store, protect and handle products to site under provisions of Section 01 6000.

B. Cement: Store in weathertight enclosures and protect against dampness, contamination and warehouse set.

C. Aggregates:
   1. Stockpile to prevent excessive segregation, or contamination with other materials or other sizes of aggregates.
   2. Use only one supply source for each aggregate stockpile.

D. Admixtures:
   1. Store to prevent contamination, evaporation, or damage.
   2. Protect liquid admixtures from freezing or harmful temperature ranges.
   3. Agitate emulsions prior to use.

1.07 ENVIRONMENTAL REQUIREMENTS

A. Allowable Concrete Temperatures:
   1. Cold weather: Maximum and minimum ACI-301, Para. 7.6.
   2. Hot weather: Maximum 90 degrees F (32 degrees C).

B. Do not place concrete during rain, sleet, snow or when surface is wet or frozen.

1.08 FIELD SAMPLES

A. Provide field samples under provisions of Section 01 4000.

B. Contractor is to construct the following samples in a protected location where samples can be retained as approved exhibits of materials and workmanship to serve as criteria for exposed site work concrete finishes in the project:
   1. 4 foot x 4 foot x 4 inch panel demonstrating walk finish including one (1) score joint.

1.09 PREINSTALLATION CONFERENCE

A. Conform to the provisions of Section 01 3900.

B. Prior to any construction of the site work concrete portions of the project, the Contractor is to call a preinstallation conference including the project superintendent, his concrete foreman, subcontractors for this portion of the work, the testing laboratory, Architect, and others as required by the Architect.

PART 2 PRODUCTS

2.01 FORM MATERIALS

A. Form Materials: As specified in Section 03 3010.

B. Joint Filler: ASTM D1751, premolded bituminous fiber filler.

2.02 REINFORCEMENT

A. Reinforcing Steel and Wire Fabric: Type specified in Section 03 3010.

2.03 CONCRETE MATERIALS

A. Concrete Material: As specified in Section 03 3010.

B. Aggregates:
1. All exterior sitework concrete: To be ASTM C33 crushed limestone, size 8 with maximum absorption rate not to exceed 5 percent.
2. Abrasive non-slip aggregates: Aluminum Oxide Grits (Alundum) or equal, not corrosive aggregates.
3. Sand: ASTM C33.

C. Non-slip Aggregate Surfaces:
1. Equivalent to Euclid Chemical Company "non-slip" with coverage rate of 25 lbs per 100 sq.ft.

D. Sand: ASTM C33

E. Admixtures: Section 03301 - All exterior sitework concrete is to be Air Entrained to produce 4 to 6 percent by volume per ASTM C260.

2.04 ACCESSORIES

A. Curing Compound: As specified in Section 03 3010.

2.05 CONCRETE MIX

A. General:
1. It is the responsibility of the Contractor to select and submit for approval mix designs which will produce properly workable and placeable concrete conforming to the quality and strengths specified. General conformance to Section 03 3010 is required for all exterior sitework concrete unless noted otherwise herein.

B. Required Strengths: All exterior sitework concrete to be f'c 4500 psi, limestone aggregate concrete.

C. All admixtures must be approved in writing by the Architect prior to use.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify base conditions under provisions of Section 01 3900.

B. Verify compacted subgrade in acceptable and ready to support concrete and imposed loads.

C. Verify gradients and elevations of base are correct.

3.02 PREPARATION

A. Moisten base to minimize absorption of water from fresh concrete.

B. Notify Architect minimum of 24 hours prior to commencement of concreting operations.

3.03 FORMING

A. Place and secure forms to correct location, dimension, and profile.

B. Assemble formwork to permit easy stripping and dismantling without damaging concrete.

C. Place joint filler vertical in position, in straight lines. Secure to formwork during concrete placement.

3.04 REINFORCEMENT

A. Reinforcing, placing and supporting as per Section 03 3010.

B. Reinforce with 6 x 6 x W1.4 x W1.4 minimum.

3.05 PLACING CONCRETE

A. Place concrete as specified in Section 03 3010.

B. Ensure reinforcement, inserts, embedded parts, and formed joints are not disturbed during concrete placement.

C. Place concrete continuously between predetermined construction joints. Do not break or interrupt successive pour such that cold joint occurs.

3.06 JOINTS

A. Place expansion joints at 20 ft. maximum o.c. or as shown on drawings.

B. Place joint filler between concrete components and building or other appurtenances.

C. Provide 1/4 inch V eased edge scored joints at 5 ft - 0 inch o.c. maximum in concrete walks.

3.07 FINISHING

A. All Exterior Sitework Concrete is to be deposited per ACI-301, Section 8.3 and is to be finished by hand floating to a Class B tolerance per ACI-301, Para 11.9, modified to include not more than 1/8 inch variation in any 2 ft - 0 inch from a true straight edge. Hand trowel, do not machine trowel to a finished Class B tolerance as defined above ready for "broom" and/or other "surface" finish as defined below.

B. Normal Concrete Surface (NOT WASHED):
   1. Walks, Drives and Curbs

a. Finishing to be a "light broom" per ACI-301, Para. 11.7.4 (NO MACHINE TROWEL). Tool all joints and all edges to provide a smooth border to each section or division of the walk or drive. Cross-score with 1/4 inch deep joints at minimum five ft intervals.
b. Finish all vertical surfaces (cheek walls and curbs) per ACI-301, Para. 10.3.1 "Rubbed Finish" in a manner that leaves the exposed surfaces free of "honeycombing" and form marks. Any damaged surfaces shall be repaired and stone rubbed to match adjacent finished surfaces as directed by Architect.

2. Ramps and Steps:
   a. Provide "non-slip" finish for ramps and steps per ACI-301, Para. 11.7.6 and 11.7.7, using aluminum oxide abrasive particles.
   b. Finish to "Broom" per ACI-301, Para 11.7.4, without machine troweling as 3.07B.1 herein.

3.08 CURING

A. Place curing compound on exposed concrete surfaces immediately after finishing. Apply in accordance with manufacturer's instructions.

3.09 FIELD QUALITY CONTROL

A. Field testing will be performed under provisions of Section 01 4325.

B. Three concrete test cylinders will be taken for every 100 or less cu.yds. of concrete placed each day.

C. One additional test cylinder will be taken during cold weather and cured on site under same conditions as concrete it represents.

D. One slump test will be taken for each set of test cylinders taken.

E. Maintain records of placed concrete items. Record date, location of pour, quantity, air temperature, and test samples taken.

3.10 PROTECTION

A. Immediately after placement, protect pavement from premature drying, excessive hot or cold temperatures, and mechanical injury.

3.11 REPAIR OF SURFACE DEFECTS

A. As specified in Section 03 3010.

3.12 CLEANING

A. Concrete approaches, walks, curbs, gutters, and related work shall be hosed down with water, scrubbed with fiber brushes, allowed to dry and be left broom clean.

B. Upon completion of the work of this section, remove from the premises all debris relating to this portion of the work.

END OF SECTION

PART 1 GENERAL

1.01 SUMMARY

A. This section includes seeding and sodding of disturbed existing grassy areas and new grass areas as indicated on the plans.

1.02 DEFINITIONS

A. Finish Grade: Elevation of finished surface of planting soil.

B. Manufactured Soil: Soil produced off-site by homogeneously blending mineral soils or sand with stabilized organic soil amendments to produce topsoil or planting soil.

C. Planting Soil: Native or imported topsoil, manufactured topsoil, or surface soil modified to become topsoil; mixed with soil amendments.

D. Subgrade: Surface or elevation of subsoil remaining after completing excavation, or top surface of a fill or backfill immediately beneath planting soil.

1.03 SUBMITTALS

A. Product Data: For each type of product indicated.

B. Product Certificates.

C. Planting Schedule: Indicating anticipated planting dates.

1.04 QUALITY ASSURANCE

A. Installer's Field Supervision: Require Installer to maintain an experienced full-time supervisor on Project site when planting is in progress.

B. Topsoil Analysis: Furnish soil analysis by a qualified soil-testing laboratory.

1.05 DELIVERY, STORAGE AND HANDLING

A. Sod: Harvest, deliver, store, and handle sod according to requirements in TPI's "Specifications for Turfgrass Sod Materials" and "Specifications for Turfgrass Sod Transplanting and Installation" in its "Guideline Specifications to Turfgrass Sodding."

1.06 LAWN MAINTENANCE

A. Begin maintenance immediately after each area is planted and continue until acceptable lawn is established, but for not less than the following periods:
   1. Seeded Lawns: 60 days from the date of Substantial Completion.
   2. Sodded Lawns: 30 days from the date of Substantial Completion.

B. Mow lawn as soon as top growth is tall enough to cut. Remove no more than 40 percent of grass-leaf growth in initial or subsequent mowings.

PART 2 - PRODUCTS

2.01 SEED

A. The seed shall be labeled in accordance with U.S. Department of Agriculture rules and regulations under the Federal Seed Act. All seed shall be furnished in sealed standard containers. Seed which has become wet, moldy, or otherwise damaged in transit or storage will not be acceptable. Submit all seed certificates to the Owner's Representative.

B. The following seed groups shall be used, depending upon time of seeding:

Seed Date	Seed	Quantity Percent by Weight	Pounds per 1000 sq. ft.
Jan. 1 to Apr. 15	English Rye	100	2.5 pounds
Apr. 15 to Aug. 15	Bermuda Grass (Hulled)	100	1.15 pounds
Aug. 15 to Dec. 30	English Rye	20	2.5 pounds

2.02 SOD

A. Sod shall be Bermuda grass sod that is live growing grass.

2.03 PLANTING MATERIALS

A. Topsoil: ASTM D 5268, pH range of 5.5 to 7, a minimum of 6 percent organic material content; free of stones 1 inch or larger in any dimension and other extraneous materials harmful to plant growth.
   1. Topsoil Source: Reuse surface soil stockpiled on-site and supplement with imported or manufactured topsoil from off-site sources when quantities are insufficient. Verify suitability of stockpiled surface soil to produce topsoil.
   2. Topsoil Source: Amend existing in-place surface soil to produce topsoil. Verify suitability of surface soil to produce topsoil. Surface soil may be supplemented with imported or manufactured topsoil from off-site sources.

B. Inorganic Soil Amendments:
   1. Lime: ASTM C 602, Class T or O, agricultural limestone containing a minimum 80 percent calcium carbonate equivalent.
   2. Sulfur: Granular, biodegradable, containing a minimum of 90 percent sulfur, with a minimum 99 percent passing through No. 6 (3.35-mm) sieve and a maximum 10 percent passing through No. 40 (0.425-mm) sieve.
   3. Iron Sulfate: Granulated ferrous sulfate containing a minimum of 20 percent iron and 10 percent sulfur.
   4. Aluminum Sulfate: Commercial grade, unadulterated.

C, Organic Soil Amendments
   1. Compost: Well-composted, stable and weed-free organic matter, pH range of 5.5 to 8.
   2. Peat: Sphagnum peat moss, partially decomposed, finely divided or granular texture, with pH range of 3.4 to 4.8.
   3. Peat: Finely divided or granular texture, with pH range of 6 to 7.5, containing partially decomposed moss peat, native peat, or reed-sedge peat and having water-absorbing capacity of 1100 to 2000 percent.
   4. Wood Derivatives: Decomposed, nitrogen-treated sawdust, ground bark, or wood waste; of uniform texture, free of chips, stones, sticks, soil, or toxic materials.

D. Fertilizer:
   1. Fertilizer: The fertilizer shall meet the requirements of the State of Arkansas Department of Agriculture and Commerce for commercial fertilizer. Pre-Planting 11-8-4; Top dress 16-6-8. Fertilizer shall be uniform in composition, free flowing and suitable for application with approved equipment; delivered to the site in convenient containers, each fully labeled, bearing the name, trade name, or trademark, and warranty of the producer.

E. Mulches:
   1. Straw Mulch: Provide air-dry, clean, mildew and seed-free, salt hay or threshed straw of wheat, rye, oats or barley.
   2. Peat Mulch: Sphagnum peat moss, partially decomposed, finely divided or granular texture, with pH range of 3.4 to 4.8.
   3. Peat Mulch: Finely divided or granular texture, with pH range of 6 to 7.5, containing partially decomposed moss peat, native peat, or reed-sedge peat and having water-absorbing capacity of 1100 to 2000 percent.
   4. Compost Mulch: Well-composed, stable and weed-free organic matter, pH range of 5.5 to 8.

PART 3 EXECUTION

3.01 LAWN PREPARATION

A. Newly Graded Subgrades: Loosen subgrade to a minimum depth of 4 inches. Remove stones larger than 1 inch in any dimension and sticks, roots, rubbish, and other extraneous matter and legally dispose of them off Owner's property.
   1. Apply superphosphate fertilizer directly to subgrade before loosening.
   2. Thoroughly blend planting soil mix off-site before spreading or spread topsoil, apply soil amendments and fertilizer on surface, and thoroughly blend planting soil mix.
   3. Spread planting soil mix to a depth of 4 inches but not less than required to meet finish grades after light rolling and natural settlement. Do not spread if planting soil of subgrade is frozen, muddy or excessively wet.

B. Unchanged Subgrades: If lawns are to be planted in areas unaltered or undisturbed by excavating, grading or surface soil stripping operations, prepare surface soil as follows:
   1. Remove existing grass, vegetation and turf. Do not mix into surface soil.
   2. Loosen surface soil to a depth of at least 6 inches. Apply soil amendments and fertilizers according to planting soil mix proportions and mix thoroughly into top 4 inches of soil. Till soil to a homogeneous mixture of fine texture.
   3. Remove stones larger than 2 inches in any dimension and sticks, roots, trash and other extraneous matter.
   4. Legally dispose of waste material, including grass, vegetation and turf, off Owner's property.

C. Finish Grading: Grade planting areas to a smooth, uniform surface plane with loose, uniformly fine texture. Grade to within plus or minus ½ inch of finish elevation. Roll and rake, remove ridges, and fill depressions to meet finish grades. Limit fine grading to areas that can be planted in the immediate future.

D. Moisten prepared lawn areas before planting if soil is dry. Water thoroughly and allow surface to dry before planting. Do not create muddy soil.

E. Restore areas if eroded or otherwise disturbed after finish grading and before planting.

3.02 SEEDING

A. Sow seed at the rate of 3 to 4 lb./1000 sq. ft.

B. Rake seed lightly into top 1/8 inch of topsoil, roll lightly, and water with fine spray.

C. Protect seeded areas with slopes not exceeding 1:6 by spreading straw mulch. Spread uniformly at a minimum rate of 2 tons/acre to form a continuous blanket 1-1/2 inches in loose depth over seeded areas. Spread by hand, blower or other suitable equipment.

D. Protect seeded areas from hot, dry weather or drying winds by applying compost mulch within 24 hours after completing seeding operations. Soak and scatter uniformly to a depth of 3/16 inch and roll to a smooth surface.

3.03 SODDING

A. Lay sod within 24 hours of harvesting. Do not lay sod if dormant or if ground is frozen or muddy.

B. Lay sod to form a solid mass with tightly fitted joints. Butt ends and sides of sod; do not stretch or overlap. Stagger sod strips or pads to offset joints in adjacent courses. Avoid damage to subgrade or sod during installation. Tamp and roll lightly to ensure contact with subgrade, eliminate air pockets, and form a smooth surface. Work sifted soil or fine sand into minor cracks between pieces of sod; remove excess to avoid smothering sod and adjacent grass.
1. Lay sod across angle of slopes exceeding 1:3.
2. Anchor sod on slopes exceeding 1:6 with wood pegs or steel staples spaced as recommended by sod manufacturer but not less than 2 anchors per sod strip to prevent slippage.

C. Saturate sod with fine water spray within two hours of planting. During first week, water daily or more frequently as necessary to maintain moist soil to a minimum depth of 1-1/2 inches (38 mm) below sod.

3.04 SATISFACTORY LAWNS

A. Satisfactory Seeded Lawn: At end of maintenance period, a healthy, uniform, close stand of grass has been established, free of weeds and surface irregularities, with coverage exceeding 90 percent over any 10 sq. ft. and bare spots not exceeding 5 by 5 inches.

B. Satisfactory Sodded Lawn: At end of maintenance period, a healthy, well-rooted, even-colored, viable lawn has been established, free of weeds, open joints, bare areas, and surface irregularities.

C. Reestablish lawns that do not comply with requirements and continue maintenance until lawns are satisfactory.

END OF SECTION