PROJECT MANUAL

for

Wilco
New Building & Site Construction
Eugene, Oregon

Client:

WILHOOF, LLC
PO Box 1800
Corvallis, Oregon 97339

Architect:

NOVAK ARCHITECTURE, INC
8380 SW Nyberg Street | Suite B
Tualatin, Oregon 97062

Project Number 18-25
March 10, 2023

PROJECT MANUAL FOR:

WILCO
NEW CONSTRUCTION
NW 11th and Willow Creek
Eugene, Oregon

OWNER:

WILHOOF, LLC
PO Box 1800
Corvallis, Oregon 97339
T: (503) 754-3630

TENANT:

WILCO
200 Industrial Way
Mt Angel, Oregon 97362
T: (541) 845-6122
F: (541) 845-9310

ARCHITECT:

NOVAK ARCHITECTURE, INC
8380 SW Nyberg Street, Suite B
Tualatin, Oregon 97062
T: (503) 352-4987

STRUCTURAL ENGINEER:

STABILITY ENGINEERING
777 NE 2nd Street, Suite 280
Corvallis, OR 97339
T: (541) 223-5360

MECHANICAL / PLUMBING / ELECTRICAL ENGINEER:

CBD ENGINEERING
35468 Riverside Drive, SW
Albany, Oregon 97321
T: (541) 619-7284

CIVIL ENGINEER:

SSW ENGINEERING, INC
2350 Oakmont Way, Suite 105
Eugene, Oregon 97401
T: (541) 485-8383

LANDSCAPE ARCHITECT:

THE SATRE GROUP
375 West 4th, Suite 201
Eugene, Oregon 97401
T: (541) 686-4540

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Eugene, Oregon

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SECTION 01010
SUMMARY OF WORK

PART 1 GENERAL

1.01 SUMMARY

A. Section Includes:
1. Work by Contractor.
2. Work by Owner.
3. Definitions.
4. Contractor Designed Elements.
5. Contractor use of site and premises.
6. Work Sequence.
7. Owner occupancy.

1.02 WORK BY CONTRACTOR

A. The work of this Contract comprises the construction of a new Wilco Farm Store Retail Building at in Eugene, Oregon. This project consists of the construction of the building exterior and interior improvements, the complete mechanical, plumbing and electrical systems, all walls, ceilings, floor coverings, and finishes, hay shed and greenhouse, as indicated on the Drawings and specified herein.

B. The General Contractor shall become familiar with the Site Civil and Landscape Construction Documents as it relates to the Scope of Work defined herein. Refer to the Site Civil Development Construction Drawings and Specifications as developed and prepared by SSW Engineers and The Satre Group.

C. Connect all utility lines placed under the Site Civil Development Package from the Buildings to underground utility lines (i.e. gas, water, storm, sanitary, power, telephone, and site electrical).

D. Contractor's Duties:
1. Provide and pay for labor, materials, tools, equipment, superintendence, temporary facilities and services necessary for proper execution and completion of work.
2. Pay legally required sales, consumer and use taxes.
3. Coordinate and arrange for:
   a. Plan Check and Permits for all Mechanical, Electrical and Plumbing work including payment of the same.
   b. Utility hook-ups, including water meters, pits meter valves, sanitary sewer, etc.
   c. All other required permits, governmental fees and licenses.
4. Owner will pay for:
   a. Plan Check and Building Permit.
   b. Utility hook-up fees.
5. Comply with building codes, ordinances and regulations of public authorities.

E. Agreement Form: Construct Work under "Stipulated Sum" Contract, AIA Document

A101, 2007 Edition, or other form acceptable to Owner.

1.03 DEFINITIONS

A. General Requirements: Provisions or requirements of Divisions 1 sections apply to entire Contract.

B. Directed, Requested, etc: Where not otherwise explained, terms such as "directed", "requested", "authorized", "selected", "approved", "required", "accepted", and "permitted" mean "directed by Architect", "requested by Architect", etc. However, no such implied meaning will be interpreted to extend Architect's responsibility into Contractor's area of construction supervision and material quality control.

C. Furnish: Expect as otherwise defined in greater detail, "furnish" is used to mean supply and deliver products to project site, ready for unpacking, assembly, installation, etc., as applicable in each instance.

D. Install: Except as otherwise defined in greater detail "install" is used to describe operations at project site including unloading, unpacking, assembly, erection, placing, anchoring, applying, working to dimension, finishing, curing, protecting, cleaning and similar operations, as applicable in each instance.

E. Provide: Except as otherwise noted defined in greater detail, "provide" means to furnish and install, complete and ready for intended use, as applicable in each instance.

1.05 CONTRACTOR DESIGNED ELEMENTS

A. Where work of this Contract requires bidder/designer to comply with following:
   1. Submit Shop Drawings and Calculations to Architect for review.
   2. Submit Shop Drawings and Calculations to the local jurisdictions for approval and permits.
   3. If required by local jurisdiction, all mechanical, plumbing, electrical and structural Shop Drawings and Calculation shall be stamped by Registered Engineer licensed in the state where the project is located.

B. Contractor “Bidder” Designed schedule:
   1. Fire suppression and alarm system
   2. Pre-fabricated metal awnings
   3. Steel stair, handrails and guardrails
   4. Wood trusses
   5. Chain link fencing and sliding gates at Wire Yard
   6. Steel roof trusses

1.06 CONTRACTOR USE OF PREMISES

A. Limit use of Site and premises to allow:
   1. Owner occupancy.
   2. Work by Others.

B. Confine operations at Site to areas permitted by:
   1. Law.

2. Ordinances.
3. Permits.
4. Contract Documents.

C. Construction Operations:
1. Do not unreasonably encumber site with materials and/or equipment.
2. Do not load structure with weight which could endanger structure.

D. Time Restrictions for Performing Work: As required by local governing jurisdiction and by Covenance and Conditions for the property.

E. Storage: Refer also to Section 01600.
1. Assume full responsibility for protection and safekeeping of products stored on premises.
2. Move stored products which interfere with operations of Owner or Owner's Contractors.
3. Obtain and pay for use of additional storage or work areas required by operations.

1.07 WORK SEQUENCE

A. Construct Work to accommodate Owner's occupancy requirements. During construction period, coordinate construction schedule and operations with Owner and Architect.

PART 2 PRODUCTS (Not Applicable)

PART 3 EXECUTION (Not Applicable)

END OF SECTION

SECTION 01030
ALTERNATES

PART 1 GENERAL

1.01 SUMMARY

A. Section Includes:
   1. Submission procedures.
   2. Documentation of changes to Contract Sum/Price and Contract Time.

B. Related Sections:
   1. Section 01019 - Contract Considerations.
   2. Section 01300 - Submittals: Work schedule affected by Alternates.

1.02 REQUIREMENTS

A. Specific and detailed items of work related to Alternates are described in other Sections of these Specifications and on Drawings.

B. Submit Alternates with full description of proposed Alternate and affect on adjacent or related components.

C. Coordinate related work and modify surrounding work to integrate Work of each Alternate.

D. Indicate variation of Bid Price for Alternates described below and list in Bid Form Document or any supplement to it, which requests 'difference' in Bid Price by adding to or deducting from base bid price.

1.03 SELECTION AND AWARD OF ALTERNATIVES

A. Alternates quoted on Bid Forms will be reviewed and accepted or rejected at Owner's option. Accepted Alternates will be identified in Owner-Contractor Agreement.

B. Bid will be evaluated on base bid price. After determination of preferred bidder, consideration will be given to Alternates and Bid Price Adjustments.

PART 2 PRODUCTS (Not Applicable)

PART 3 EXECUTION (Not Applicable)

END OF SECTION

SECTION 01039
COORDINATION AND MEETINGS

PART 1 GENERAL

1.01 SUMMARY

A. Section Includes:
1. Coordination.
2. Field engineering.
3. Project Survey Requirements.
4. Alteration project procedures.
5. Cutting and patching.
6. Preconstruction conference.
7. Progress meetings.
8. Pre-installation conferences.

1.02 COORDINATION

A. Contractor shall be responsible for locating and verifying all utility service connection points inclusive of water, sanitary sewer, storm drainage, electrical, telephone, gas service, and any other services as described herein and as shown on the Drawings, and as reflected in the sitework civil development drawings and specifications. Contractor shall be responsible for accurately locating depths of such utilities and shall coordinate all building shell utilities with the actual in place sitework utilities. If discrepancies between sitework and building utilities should arise, the Contractor shall modify or remedy at no additional cost to the Owner.

B. The Contractor shall coordinate uses of the site and building areas with the sitework effort. During the course of construction, damages which may occur to finished asphalt paving, concrete curbs, site utilities, site fixtures, etc., shall be remedied by the Contractor at no additional cost to the Owner.

C. Contractor shall coordinate with the sitework that the building pad is at the actual designed elevation, and that all soils testing criteria and requirements have been achieved. Commencement with the scope of work constitutes acceptance by the Contractor. Any discrepancies discovered after the start of such work shall be remedied by the contractor at no additional cost to the Owner, unless written agreement is acquired prior to commencement of such work.

D. Assume full responsibility for overall coordination of Project:
1. Coordinate with Building Official.
2. Coordinate with Owner's inspecting and testing service.
3. Coordinate work schedule with Architect and Owner's Representative.
4. Coordinate among work of all trades.
5. Provide access to construction area for other Contractors.

E. Coordinate Work of Mechanical and Electrical Subcontractors:
1. With work of trades and suppliers of products specified in Divisions 2 through 10.
2. Among work of trades and suppliers of products specified in Division 15 and 16.

3. For temporary utilities work specified in Division 1.

F. Coordinate changes to assure that:
   1. Requirements of Contract Documents are fulfilled.
   2. Changes in Contract requirements of all affected trades are reflected in executed Change Orders.

G. Scheduling and Installation Sequence:
   1. Coordinate scheduling, submittals, and Work of various Sections of specifications to assure efficient and orderly sequence of installation of interdependent construction elements, with provisions for accommodating items installed later.
   2. Schedule work in accordance with current Project Construction Schedule.
      a. Coordinate schedules of all trades.
      b. Verify timely deliveries of products for installation by other trades.
      c. Verify that labor and equipment are adequate for work and schedule.
      d. Verify that material deliveries are adequate to maintain schedule.

H. Utility Requirements:
   1. Verify that utility requirement characteristics of operating equipment are compatible with building utilities.
   2. Coordinate work of various Sections having interdependent responsibilities for installing, connecting to, and placing in service, such equipment.

I. Space Requirements:
   1. Coordinate space requirements and installation of mechanical and electrical work which are indicated diagrammatically on Drawings.
   2. Follow routing shown for pipes, ducts, and conduit, as closely as practicable; place runs parallel with line of building.
   3. Utilize spaces efficiently to maximize accessibility for other installations, for maintenance, and for repairs.

J. Provide adequate clearance between Architectural, Structural, Mechanical, and Electrical systems. Verify physical dimensions of equipment with its available space. Check access routs through concealed spaces.

K. Review Drawings and Specifications for the possible conflicts prior to rough-in. Contractor is responsible for verification that equipment will fit in the space provided. Resolve conflicts with Architect prior to rough-in work. Commencing work constitutes that the Contractor has reviewed the type of equipment and that the space allowance is sufficient for total installation of such equipment. The Contractor shall provide any modifications to equipment and space allowances at no additional cost to the Owner.

L. Concealed Services:
   1. In finished areas, conceal pipes, ducts, and wiring within the construction.
   2. Coordinate locations of fixtures and outlets with finish elements.

M. Cutting and Patching: Ascertain need for cutting and patching, and coordinate with work of other trades.

N. Provide daily coordination of site maintenance and clean-up. Do not let materials or debris be disorganized.

O. Completion and Clean Up:
   1. Coordinate completion and clean up of Work of separate Sections in preparation for Substantial Completion.

P. Start-Up, Inspection and Acceptance of Equipment:
   1. Verify that Manufacturer's representative is present.
   2. Verify that utilities, specified connections and safety devices are complete, and equipment is ready to operate.
   3. Verify that equipment has been tested, adjusted and balanced, is cleaned, repainted as required, and operational prior to inspection.

Q. Access for Corrective Work:
   1. After Owner occupancy of premises, coordinate access to Site for correction of defective Work and Work not in accordance with Contract Documents, to minimize disruption of Owner's activities.

1.03 FIELD ENGINEERING

A. Employ Land Surveyor registered in State in which the project is located acceptable to the Owner.
B. Owner will locate survey control and reference points. Contractor shall protect.

C. Control datum for survey is that established by Owner provided survey.

D. Provide and pay for field engineering services as follows:
   1. Establish elevations, lines, and levels, utilizing recognized engineering survey practices.
   2. Survey and staking work required in execution of the Project as defined herein.
   3. Civil, structural, or other professional engineering services specified, or required to execute Contractor's construction methods.
   4. Survey and staking of all existing underground utilities within the proposed area of building and adjacent site construction. Coordinate with the General Contractor of the Site Civil Development Package.

E. Submit certificate signed by Land Surveyor that elevations and locations of Work are in conformance with Contract Documents.

1.04 PROJECT SURVEY REQUIREMENTS

A. Establish a minimum of two permanent bench marks for each building on the site, referenced to data established by survey control points. Record locations, with horizontal and vertical data, on Project Record Documents.

B. Establish lines and levels, locate and lay out, by instrumentation and similar appropriate means:
   1. Batter boards for structures.
   2. Building foundation, column locations and floor levels.
   3. Controlling lines and levels required for the mechanical and electrical trades.

C. From time to time, verify layouts by the same methods.

D. Maintain a complete, accurate log of all control and survey work as it progresses.

E. On completion of foundation walls and major building shell structure improvements, prepare a certified survey showing all dimensions, locations, angles, and elevations of construction. Submit three (3) copies to Owner.

F. Submit documentation to verify accuracy of field engineering work.

1.05 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 manner to minimize damage and to provide 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 neat transition to adjacent finishes.

E. Transition Between New and Existing:
1. Where new work abuts or aligns with existing, perform smooth and even transition.
2. Patched work shall match existing adjacent work in texture and appearance.
3. When finished surfaces are cut so that smooth transition with new work is not possible, terminate existing surface along straight line at natural line of division and make recommendation to Architect.
4. Where change of plane of 1/4 inch or more occurs, submit recommendation for providing smooth transition for Architect review.

F. Damaged Surfaces: Patch or replace, as directed by Architect, portions of existing surfaces which are damaged, lifted, discolored, or showing other imperfections.

G. Finish surfaces as specified in individual product Sections.

1.06 CUTTING AND PATCHING

A. Employ skilled and experienced installer to perform cutting and patching.

B. Submit written request in advance of cutting or altering elements which affects:
1. Structural integrity of element.
2. Integrity of weather-exposed or moisture-resistant elements.
3. Efficiency, maintenance, or safety of element.
4. Visual qualities of sight-exposed elements.
5. Work of Owner or separate contractor.

C. Execute cutting, fitting, and patching including excavation and fill, to complete Work, and to:

1. Fit several parts together, to integrate with other Work.
2. Uncover Work to install or correct ill-timed Work.
3. Remove and replace defective and non-conforming Work.
4. Remove samples of installed Work for testing.
5. Provide openings in elements of Work for penetrations of mechanical and electrical Work.

D. Execute work by methods which will avoid damage to other Work, and provide proper surfaces to receive patching and finishing.

E. Cut rigid materials using masonry saw or core drill.

F. Provide shoring, bracing, and support as required to maintain structural integrity of the project.

G. Restore Work with new products in accordance with requirements of Contract Documents.

H. Fit Work tight to pipes, sleeves, ducts, conduit, and other penetrations through surfaces.

I. Maintain integrity of wall, ceiling, or floor construction; completely seal voids.

J. Refinish surfaces to match adjacent finishes. For continuous surfaces, refinish to nearest intersection; for an assembly, refinish entire unit.

K. Identify any hazardous substance or condition exposed during Work to Architect for decision or remedy.

1.07 PRECONSTRUCTION CONFERENCE

A. Contractor shall schedule conference after Notice of Award.

B. Agenda:
1. Use of premises by Owner and Contractor.
2. Submission of executed bonds and insurance certificates.
3. Distribution of Contract Documents.
4. Submission of list of Subcontractors, list of products, Schedule of Values, and progress schedule.
5. Designation of personnel representing parties in Contract, and Architect.
6. Procedures and processing of field decisions, submittals, substitutions, applications for payments, proposal request, Change Orders and Contract closeout procedures.
7. Scheduling.
8. Security and housekeeping procedures.
9. Procedures for testing.
10. Procedures for maintaining Record Documents.

C. Attendance Required: Owner, Architect, Special Consultants, Contractor, Contractor's Superintendent, and major Subcontractors.

1.08 PROGRESS MEETINGS

A. Contractor shall schedule and administer meetings throughout progress of Work at maximum weekly intervals.

B. Make arrangements for meetings, prepare agenda with copies for participants, preside at meetings, record minutes, and distribute copies within two days to Architect, Owner, participants, and those affected by decisions made.

C. Attendance Required: Job superintendent, major Subcontractors and suppliers, Owner, Architect, as appropriate to agenda topics for each meeting.

D. Agenda:
   1. Review minutes of previous meetings.
   2. Review of Work progress.
   3. Field observations, problems, and decisions.
   4. Identification of problems which impede planned progress.
   5. Review of submittals schedule and status of submittals.
   6. Review of off-site fabrication and delivery schedules.
   7. Maintenance of progress schedule.
   8. Corrective measures to regain projected schedules.
   9. Planned progress during succeeding work period.
   10. Coordination of projected progress.
   11. Maintenance of quality and work standards.
   12. Effect of proposed changes on progress schedule and coordination.
   13. Other business relating to Work

1.09 PRE-INSTALLATION CONFERENCES

A. When required in individual specification Section, convene pre-installation conference at work site prior to commencing work of Section.

B. Require attendance of parties directly affecting, or affected by, work of specific Section.

C. Notify Architect and Owner seven days in advance of meeting date.

D. Prepare agenda, preside at conference, record minutes, and distribute copies within two days after conference to participants, with two copies to Architect.

E. Review conditions of installation, preparation and installation procedures, and coordination with related work.

PART 2 PRODUCTS (Not Applicable)

PART 3 EXECUTION (Not Applicable)

END OF SECTION

SECTION 01300
SUBMITTALS

PART 1 GENERAL

1.01 SUMMARY

A. Section Includes:
1. Submittal procedures.
2. Construction progress schedules.
3. Proposed products list.
4. Product data.
5. Shop drawings.
6. Samples.
7. Manufacturers' instructions.
8. Manufacturers' certificates.
9. Submittal quantities.
10. Submittal schedule.

B. Related Sections:
1. Section 01030 - Alternates.
2. Section 01400 - Quality Control: Manufacturers' field services and reports.
3. Section 01700 - Contract Closeout: Contract warranty, manufacturer's certificates and closeout submittals.

1.02 SUBMITTAL PROCEDURES

A. All submittals shall be submitted within 60 days after date of Owner Contractor Agreement.

B. Sequentially number transmittal forms. Re-submittals shall have original number with 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 requirements of Work and Contract Documents.

E. Schedule submittals to expedite Project, and deliver to Architect at business address. Coordinate submission of related items.

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

G. Provide space for Contractor and Architect review stamps.

H. Revise and resubmit submittals as required, identify all changes made since previous submittal.

I. Distribute copies of reviewed submittals to concerned parties. Instruct parties to promptly report any inability to comply with provisions.

1.03 CONSTRUCTION PROGRESS SCHEDULES

A. Submit initial progress schedule in duplicate within 15 days after date of Owner-Contractor Agreement for Architect review.

B. Revise and resubmit as required.

C. Submit revised schedules with each Application for Payment, identifying changes since previous version.

D. Submit computer generated chart with separate line for each major section of Work or operation, identifying first work day of each week.

E. Show complete sequence of construction by activity, identifying Work of separate stages and other logically grouped activities. Indicate early and late start, early and late finish, float dates, and duration.

F. Indicate estimated percentage of completion for each item of Work at each submission.

G. Indicate submittal dates required for shop drawings, product data, samples, and product delivery dates, including those furnished by Owner and under Allowances.

1.04 PROPOSED PRODUCTS LIST

A. Within 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.

1.05 PRODUCT DATA

A. Submit product data required by Contract Documents for execution of work, to Architect not later than 60 days after the date of Owner Contractor Agreement, and earlier where more time may be required for review.

B. Provide product data with cross-reference to Specifications Section of Project Manual to facilitate review.

C. Provide product data including manufacturer's catalog sheets, brochures, diagrams, schedules, performance charts, illustrations and other standard descriptive data.

D. Submit number of copies which Contractor requires, plus three copies which will be retained by Architect.

E. Mark each copy to identify applicable products, models, options, and other data.

Supplement manufacturers' standard data to provide information unique to this Project.

F. After review, distribute in accordance with Article on Procedures above and provide copies for Record Documents described in Section 01700 - Contract Closeout.

1.06 SHOP DRAWINGS

A. Submit Shop Drawings, required by Contract Documents for execution of Work, to Architect not later than 30 days after date of Owner Contractor Agreement or earlier where more time may be required for review.

B. Provide Shop Drawings, with cross-reference to drawing and detail numbers on Contract Drawings to facilitate review.

C. Provide Shop Drawings which demonstrate to Architect that:
   1. Contractor understands design concept of certain portions of Work.
   2. Equipment and material to be provided meet design and technical requirements of Contract Documents.
   3. Methods of fabrication and installation.

D. Submit in form of one reproducible transparency and five opaque reproductions.

E. After review, reproduce and distribute in accordance with Article on Procedures above and for Record Documents described in Section 01700 - Contract Closeout.

1.07 SAMPLES

A. Submit samples of size and quantity specified, or, if not specified, of sufficient size and quantity to illustrate functional and aesthetic characteristics of Product, with integral parts and attachment devices. Coordinate sample submittals for interfacing work.

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

C. Include identification on each sample, with full Project information.

D. Submit number or samples specified in individual specification Sections; one of which will be retained by Architect.

E. Reviewed samples which may be used in Work are indicated in individual specification Sections.

1.08 MANUFACTURER'S INSTRUCTIONS

A. When specified in individual specification Sections, submit 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.

1.09 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.

1.10 REQUIRED SUBMITTAL QUANTITIES TO ARCHITECT:

		Reproducible Transparencies	Opaque Prints
A.	Construction Schedule:		
1.	8-½" x 11" size:	0	3
2.	Larger than 8-½" x 11":	1	3
B.	Survey Data:		
1.	8-½" x 11":	0	3
2.	Larger than 8-½" x 11":	1	3
C.	Shop Drawings:		
1.	8-½" x 11":	0	3
2.	Larger than 8-½" x 11":	1	3
D.	Product Data:		
1.	8-½" x 11":	0	3
2.	Larger than 8-½" x 11":	1	3
E.	Office Samples:	See specific section covering product or material.	
F.	Schedule of Values:	0	3

1.11 SCHEDULE FOR SUBMITTALS:

	Contractor	First Submittal (No. of Days)	Architect Review In (No. of Days)	Update and Resubmit In (No. of Days)
A.	Construction Schedule:	15 after award of contract	5	30
B.	Survey Data:	15 after award of contract	15	—
C.	Shop Drawings:	30 after award	15	—
D.	Product Data:	30 after award	15	—
E.	Samples:	30 after award	15	—

F.	Schedule of Values:	Prior to application for payment	5	30

PART 2 PRODUCTS (Not Applicable)

PART 3 EXECUTION (Not Applicable)

END OF SECTION

SECTION 01400
QUALITY CONTROL

PART 1 GENERAL

1.01 SUMMARY

A. Section Includes:
1. Quality assurance and control of installation.
2. References.
3. Field samples.
4. Mock-up.
5. Inspection and testing laboratory services.
6. Contractor's Inspection and Testing Responsibilities.
7. Manufacturers' field services and reports.

B. Related Sections:
1. Section 01300 - Submittals: Submission of Manufacturers' Instructions and Certificates.
2. Section 01600 - Material and Equipment: Requirements for material and product quality.
3. Section 01410 - Testing Laboratory Services.
4. Section 02200 - Earthwork: Compacted Fill and Backfill.
5. Section 03300 - Cast-in-place concrete: Cast-in-Place.
6. Section 04100 - Mortar
7. Section 04220 - Unit Masonry.

1.02 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 fully 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 minimum quality for 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. Conform to reference standard by date of issue current on date of Contract Documents or date specified in product Sections.

B. Obtain copies of standards when required by Contract Documents.

C. Should specified reference standards conflict with Contract Documents, request clarification for Architect before proceeding.

D. Contractual relationship of parties to Contract shall not be altered from Contract Documents by mention or inference otherwise in any reference document.

1.04 FIELD SAMPLES

A. Install field samples at Site as required by individual specifications Sections for review.

B. Acceptable samples represent quality level for Work.

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

1.05 MOCK-UP

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.

1.06 INSPECTION AND TESTING LABORATORY SERVICES

A. Owner will appoint, employ, and pay for services of independent firm to perform inspection and testing.

B. Independent firm will perform inspections, tests, and other services specified in individual specification Sections and as required by Architect or Engineer.

C. Reports will be submitted by independent firm to Owner, Contractor, Architect and Engineers, indicating observations and results of tests and indicating compliance or non-compliance with Contract Documents.

1.07 CONTRACTOR'S INSPECTION AND TESTING RESPONSIBILITIES

A. Cooperate with independent firm.
   1. Furnish samples of materials, design mix, equipment, tools, storage and assistance as requested.
   2. Provide access to Work and manufacturer's operations.
   3. Notify Architect and independent firm 24 hours prior to expected time for operations requiring services.
   4. Make arrangements with independent firm and pay for additional samples and tests required for Contractor's use.
   5. Furnish copies of mill test reports.
   6. Furnish casual labor and facilities:
      a. to provide access work to be tested.
      b. to obtain and handle samples at Site.

c. to facilitate inspection and tests.
d. for laboratories exclusive use for storage and curing of test samples.

7. Arrange with laboratory and pay for additional samples and tests required for Contractor's convenience.

B. Retesting:

1. Retesting required because of non-conformance to specified requirements shall be performed by same independent firm on instructions by Architect.
2. Should initial tests indicate non-compliance with Contract Documents, payment for both initial tests and subsequent retesting occasioned by non-compliance, and all costs, including additional Architect's services made necessary by such failure, will be charged to Contractor by deducting inspection or testing charges from Contract Sum/Price.

1.08 MANUFACTURERS' FIELD SERVICES AND REPORTS

A. Submit qualifications of observer to Architect 30 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. Observer shall report observations and site decisions or instructions given to applicators or installers that are supplemental or contrary to manufacturers' written instructions.

D. Submit report within 15 days of observation to Architect for review.

PART 2 PRODUCTS (Not Applicable)

PART 3 EXECUTION (Not Applicable)

END OF SECTION

SECTION 01410
TESTING LABORATORY SERVICES

PART 1 GENERAL

1.01 DESCRIPTION:

A. Owner will employ and pay for such services of an independent testing laboratory to perform inspection, sampling, and testing as required by local building codes.

B. Referenced Sections:

1. Section 03300 - CAST-IN-PLACE-CONCRETE
2. Section 04100 - MORTAR.
3. Section 04200 - UNIT MASONRY
4. Structural Drawings – Special Inspections Program

PART 2 MATERIALS – NOT USED

PART 3 EXECUTION

3.01 CONTRACTOR'S RESPONSIBILITIES: Cooperate with laboratory personnel, provide access to work, and furnish facilities for laboratory work.

3.02 EVALUATION OF TESTS AND INSPECTIONS:

A. Results of laboratory and/or field control tests and inspections shall be the principal basis upon which satisfactory completion of work shall be judged.

B. If results of tests and inspections indicate work is below requirements of Contract Documents, that portion of work is subjected to condemnation.

3.03 ADJUSTMENTS: Remove and replace work so condemned at Contractor's expense including costs of subsequent tests and inspections, and assistance by the Architect and Structural Engineer until work meets requirements of Contract Documents.

END OF SECTION

SECTION 01500

CONSTRUCTION FACILITIES AND TEMPORARY CONTROLS

PART 1 GENERAL

1.01 SUMMARY

A. Section Includes:
1. Temporary Utilities.
2. Temporary Controls.
3. Construction Facilities.
4. Removal of temporary utilities, controls and facilities.

B. Related Sections
1. Section 01700 - Contract Closeout: Final cleaning.

1.02 TEMPORARY UTILITIES

A. Temporary Electricity:
1. Provide and pay for power service required from Utility source.
2. Provide temporary electric feeder from existing electrical service at location as directed. Power consumption shall not disrupt Owner's or other contractors need for continuous service.
3. Provide flexible power cords as required.
4. Permanent convenience receptacles may not be utilized during construction.

B. Temporary Lighting:
1. Provide and maintain incandescent lighting for construction operations to achieve a minimum lighting level of 2 watt/sq ft.
2. Provide and maintain 1 watt/sq ft lighting to exterior staging and storage areas after dark for security purposes.
3. Provide and maintain lighting to interior work areas after dark for security purposes.
4. Provide branch wiring from power source to distribution boxes with lighting conductors, pigtails, and lamps as required.
5. Maintain lighting and provide routine repairs.
6. Permanent building lighting may not be utilized during construction.

C. Temporary Heat:
1. Existing facilities shall not be used.
2. Provide and pay for heat devices and heat as required to maintain specified conditions for construction operations.
3. Maintain minimum ambient temperature of 50 degrees F in areas where construction is in progress, unless indicated otherwise in specifications.

D. Temporary Ventilation:
1. Ventilate enclosed areas to:
   a. Assist cure of materials.
   b. Dissipate humidity.
   c. Prevent accumulation of dust, fumes, vapors, or gases.
   d. Provide local exhaust ventilation to prevent harmful dispersal of hazardous substances into atmosphere at all times.

2. Provide ventilation and/or heat to dry out underside of roof deck prior to installing insulation or finish.

E. Temporary Telephone and Facsimile (FAX) Service:
1. Provide, maintain and pay for telephone service and facsimile (FAX) machine, on dedicated line, to field office at time of project mobilization.
   a. Toll calls paid by party making call.
   b. Equip telephone with outside bell.
2. Maintain services from start of work through Substantial Completion.
3. Should project not be equipped with a fax, a total of $100.00 per week will be deducted from the contract amount at the end of the project.

F. Temporary Water Service:
1. Provide, maintain and pay for suitable quality water service required. Connect to existing water source for construction operations.
2. Extend branch piping with outlets located so water is available by hoses with threaded connections.

G. Temporary Sanitary Facilities:
1. Provide and maintain adequate number of required facilities and enclosures for use of all persons and trades employed on Work during Construction period. Existing facilities shall not be used.
   a. Toilet facilities.
   b. Washing facilities.

H. Temporary First Aid Facilities: Provide adequate first aid facilities for construction personnel.

I. Temporary Fire Protection:
1. Take all precautions to prevent possibility of fire resulting from construction operations. Particularly avoid hazardous accumulations of rubbish and unsecured flammable materials.
2. Provide emergency fire extinguishing equipment of adequate type and quantity, readily available and properly maintained.
3. Keep local Fire Department's telephone number prominently displayed near telephone.
4. During construction, provide a portable fire extinguisher with type 2A10BC rating within 75 foot distance to all portions of the job.

1.03 TEMPORARY CONTROLS

A. Barriers:
1. Provide barriers to prevent unauthorized entry to construction areas and to protect existing facilities and adjacent properties from damage from construction operations.
2. Provide barricades required by governing authorities for public rights-of-way.
3. Protect non-owned vehicular traffic, stored materials, site and structures from damage.

B. Fencing:
1. Construction: Commercial grade chain link fence.

2. Provide 6 foot high fence around construction materials storage area; equip with vehicular and pedestrian gates with locks.

C. Water Control:
   1. Exercise care in cleaning out equipment, etc., so as to prevent materials from clogging catch basins and yard drains.
   2. Leave all drainage items clean and in proper working condition.

D. Dust Control:
   1. Periodically wet down Site as required to keep flying dust to minimum.
   2. Vacuum clean interior surfaces of building prior to start of finish painting.
   3. Continue vacuum cleaning on as-needed basis until building is ready for Substantial Completion or occupancy.

E. Pollution Control:
   1. Burning or burying of rubbish and waste materials on Site is prohibited. Provide dump box for collection of waste materials.
   2. Disposal of volatile fluid wastes (such as mineral spirits, oil or paint thinner) in storm or sanitary sewer systems is prohibited.
   3. Keep Site and surrounding areas clear of accumulations of waste material and rubbish resulting from operations under this Contract. Remove waste from Site immediately upon completion of Work.

F. Exterior Enclosures:
   1. Provide temporary weather-tight closure 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.
   2. Provide access doors with self-closing hardware and locks.

G. Protection of Installed Work:
   1. Protect installed Work and provide special protection where specified in individual specification Sections.
   2. Provide temporary and removable protection for installed Products. Control activity in immediate work area to minimize damage.
   3. Provide and maintain temporary shoring and lateral bracing of structure during erection to resist all loads including:
      a. Wind.
      b. Seismic.
      c. Construction.
      d. Materials.
      e. Moving Equipment.
   4. Do not remove temporary bracing and shoring until adequate permanent connections or structural elements are in final position and positively anchored.
   5. Provide protective coverings at walls, projections, jambs, sills, and soffits of openings.
   6. Protect finished floors, stairs, and other surfaces from traffic, dirt, wear, damage, or movement of heavy objects, by protecting with durable sheet materials.

   7. 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.
8. Prohibit traffic from landscaped areas.
9. Protect existing curbs and pavements from damage during construction activities. Repair or replace damaged areas.

H. Security:
1. Provide security and facilities to protect Work, and Owner's operations from unauthorized entry, vandalism, or theft.
2. Provide temporary locks and doors at all openings after building is enclosed.
3. Coordinate with Owner's security program.

1.04 CONSTRUCTION FACILITIES

A. Access Roads:
1. Construct and maintain temporary roads accessing public thoroughfares to serve construction area.
2. Extend and relocate as Work progress requires. Provide detours necessary for unimpeded traffic flow.
3. Provide and maintain access to fire hydrants, free of obstructions.
4. Designated existing on-site roads may be used for construction traffic.
5. Provide barricades, warning signs, flagmen or other traffic regulators which may become necessary for protection of public, construction personnel and property.

B. Parking:
1. Provide temporary surface parking areas to accommodate construction personnel, project visitors and Owner's employees.
2. Do not allow vehicle parking on existing pavement other than the specific area authorized by Owner.

C. Progress Cleaning:
1. Maintain areas free of waste materials, debris, and rubbish. Maintain site in a clean and orderly condition.
2. Remove debris and rubbish from pipe chases, plenums, attics, crawl spaces, and other closed or remote spaces, prior to enclosing space.
3. Broom and vacuum clean interior areas prior to start of surface finishing, and continue cleaning to eliminate dust.
4. Remove waste materials, debris, and rubbish from site periodically and dispose off-site.

D. No signs are allowed without Owner permission except those required by law.

E. Field Offices and Sheds:
1. Office: Weather-tight, with lighting, electrical outlets, heating, cooling and ventilating equipment, and equipped with sturdy furniture, and drawing display table, telephone, facsimile machine, and emergency first aid facilities.

2. Provide space for project meetings, with table and chairs to accommodate 6 persons.

3. Photocopy machine shall be capable of legal and letter size plain paper. (Should project not be equipped with a suitable photocopy machine, a total of $100.00 per

week will be deducted from the contract amount at the end of the project.)

4. Sheds: Provide following facilities in temporary buildings used for material and equipment storage.
   a. Ventilation: Where required for materials being stored.
   b. Fire Extinguisher: One ABC type portable fire extinguisher, and one specialty type fire extinguisher if so required for specific materials stored.
   c. Temperatures: As required for materials being stored.

1.05 REMOVAL OF TEMPORARY UTILITIES, CONTROLS AND FACILITIES

A. Remove temporary above grade or buried utilities, equipment, facilities, materials, prior to Substantial Completion inspection.

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

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

PART 2 PRODUCTS (Not Applicable)

PART 3 EXECUTION (Not Applicable)

END OF SECTION

SECTION 01600
MATERIAL AND EQUIPMENT

PART 1 GENERAL

1.01 SUMMARY

A. Section Includes:
1. Definitions.
2. Transportation and handling.
3. Storage and protection.
4. Materials and Equipment.
5. Manufactured and fabricated products.
6. Product options and substitutions.

B. Related Sections:
1. Section 01019 - Contract Considerations.
2. Section 01400 - Quality Control: Product quality monitoring.

1.02 DEFINITIONS

A. Products:
1. New material, machinery, components, equipment, fixtures, and systems forming Work.
2. Does not include machinery and equipment used for preparation, fabrication, conveying and erection of Work.
3. Products may also include existing materials or components required for reuse.

1.03 TRANSPORTATION AND HANDLING

A. Coordinate product deliveries to avoid work schedule conflicts or delays.

B. Transport and handle products in accordance with manufacturer's instructions.

C. Deliver products undamaged, in manufacturers original containers with labels intact and legible.

D. Promptly inspect shipments to assure that products comply with requirements, quantities are correct, and products are undamaged.

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

1.04 STORAGE AND PROTECTION

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

B. Store stockpiled materials in designated areas.

C. Store and protect products in accordance with manufacturer's instructions, with seals and labels intact and legible. Store sensitive products in weather-tight, climate controlled enclosures.

D. For exterior storage of fabricated products, place on sloped supports, above ground.

E. Cover products subject to deterioration with impervious sheet covering. Provide ventilation to avoid condensation.

F. Store loose granular materials on solid flat surfaces in well-drained area. Provide mixing with foreign matter.

G. Provide equipment and personnel to store products by methods to prevent soiling, disfigurement, or damage.

H. Arrange storage of products to permit access for inspection. Periodically inspect to assure products are undamaged and are maintained under specified conditions.

PART 2 PRODUCTS

2.01 MATERIALS AND EQUIPMENT

A. All materials and equipment shall be new (except existing items specifically designated for reuse) and free from defects impairing strength, durability, or appearances.
   1. When two or more items of same kind are required under work, use items of single manufacturer except where specifically exempted.
   2. Electrical products shall bear Underwriters' Laboratories (UL) label properly attached in accordance with requirements of Regulatory Agencies.

B. All items incorporated into Work shall conform to Contract Documents and designated standards.

2.02 MANUFACTURED AND FABRICATED PRODUCTS

A. Design, fabricate and assemble products in accordance with current best engineering, industry, and shop practices.

B. Provide interchangeable components of same manufacturer, for similar components.

C. Contract Documents are based upon specific manufacturers listed in various Specification sections. Alternate manufacturers may require deviations from Contract Documents to properly install their particular product and to provide required results.
   1. Provide all additional work necessary to install such products, if approved, at no extra charge to Owner.
   2. Submit Shop Drawings showing all deviations from Contract Documents for each specific item.

2.03 PRODUCT OPTIONS AND SUBSTITUTIONS

A. Architect will consider requests for Substitutions only within 15 days after date

established in Notice to Proceed.

B. Consideration: Requests for substitution of specified products after the notice to proceed time frame will be considered only for the following reasons:
   1. Owner's or Architect's request.
   2. Reduction in contract time or contract sum.
   3. Specified product is not available from any source.
   4. Specified product would cause significant delay in contract time.

C. Submittal: Submit requests on attached Substitution Request Form.

D. Substitutions may be considered when product becomes unavailable through no fault of Contractor.

E. Document each request with complete data substantiating compliance of proposed Substitution with Contract Documents.

F. Substitution Request constitutes representation that Contractor:
   1. Has investigated proposed product and determined that it meets or exceeds quality level of specified product.
   2. Will provide same warranty for Substitution as for specified product.
   3. Will coordinate installation and make changes to other Work which may be required for Work to be complete with no additional cost to Owner.
   4. Waives claims for additional costs or time extension which may subsequently become apparent.
   5. Will reimburse Owner for review or redesign services associated with re-approval by authorities.

G. Substitutions will not be considered when they are indicated or implied on Shop Drawing or product data submittals, without separate written request, or when acceptance will require revision to Contract Documents.

H. Substitution Submittal Procedure:
   1. Submit three copies of Substitution Request Form. Limit each request to one proposed Substitution.
   2. Submit shop drawings, product data, and certified test results attesting to proposed product equivalence.
   3. Architect will notify Contractor, in writing, of decision to accept or reject request.

PART 3 EXECUTION

3.01 PREPARATION

A. Examine existing conditions, Project requirements and Contract Documents. Verify that materials and equipment furnished meet specified requirements.

3.02 INSTALLATION

A. Perform Work, handle, install, connect, clean, condition and adjust products in strict accordance with manufacturers' printed Instructions, and with Contract Document

requirements.

B. In case of conflict, Contract Documents shall govern. When in doubt, request clarification.

END OF SECTION

SECTION 01700
CONTRACT CLOSEOUT

PART 1 GENERAL

1.01 SUMMARY

A. Section Includes:
1. Closeout procedures.
2. Final cleaning.
3. Adjusting.
4. Project record documents.
5. Operation and maintenance data.
6. Warranties.
7. Spare parts and maintenance materials.

B. Related Sections:
1. Section 01300 - Submittals.
2. Section 01500 - Construction Facilities and Temporary Controls: Progress cleaning.

1.02 CLOSEOUT PROCEDURES

A. Substantial Completion:
1. Submit written certification to Architect that Work, or designated portion of Work, is substantially complete.
2. If Architect determines upon review, that Work is substantially complete:
   a. Contractor shall submit list of items requiring completion or correction as determined by Architect's review.
   b. Contractor shall obtain Certificate of Occupancy, and perform Final cleaning.
   c. Architect will prepare and issue Certificate of Substantial Completion.
   d. Owner may occupy Project, or designated portion of Project, under provisions of Certificate of Substantial Completion.
3. If Architect determines that Work is not substantially complete Architect will immediately notify Contractor in writing. Contractor shall complete and notify Architect when work is substantially complete.

B. Reinspection Fees:
1. Should Architect perform more than one reinspection due to failure of the work to comply with the claims of status of completion made by the Contractor:
   a. Owner will compensate Architect for such additional services.
   b. Owner will deduct the amount of such compensation from the final payment to the Contractor.

C. Final Review:
1. Submit written certification that Contractor has reviewed Contract Documents and inspected Work, and that Work is complete in accordance with Contract Documents and ready for Architect's review.
2. If Architect determines upon review that work is complete, Architect will notify

Contractor and request Project Record Documents, Warranties, bonds, spare parts, maintenance materials, keys, keying schedule and Certificate of Occupancy.

3. If Architect determines upon review, that Work is not complete, Architect will notify Contractor in writing, stating reasons. Contractor shall complete work and repair deficiencies. Architect will re-review Work after Contractor's notification that all Work is complete.

D. Provide submittals to Architect that are required by governing or other authorities.

E. Payments and Release of Liens:
   1. Submit two executed copies of Contractor's Affidavit of Payment of Debts and Claims, AIA G706.
   2. Submit two executed copies of Contractor's Affidavit of Release of Liens AIA G706A, including consent of Surety to Final Payment, AIA G707 and Contractor's release or waiver of liens.

F. Submit final Application for Payment identifying total adjusted Contract Sum, previous payments, and sum remaining due.

1.03 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 sanitary condition.

D. Clean filters 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 Site.

H. Maintain Work in clean condition until Owner's Final Acceptance.

1.04 ADJUSTING

A. Adjust operating Products and equipment to ensure smooth and unhindered operation.

B. Refer to Division 15 - Mechanical for adjusting of Mechanical systems.

1.05 PROJECT RECORD DOCUMENTS

A. Maintain on Site, one set of following Record Documents; record actual revisions to Work:
   1. Contract Drawings.

2. Project Manual (Conditions of Contract and Specifications.)
3. Addenda.
4. Change Orders and other Modifications to Contract.
5. Reviewed Shop Drawings, product data, and samples.
6. Field test records.

B. Store Record Documents separate from documents used for construction.

C. Record information concurrent with construction progress must be maintained weekly. Recorded documents will be reviewed at each meeting.

D. Specifications: Legibly mark and record at each Product section description of actual Products installed, including following:
1. Manufacturer's name and product model and number.
2. Product substitutions or alternates utilized.
3. Changes made by Addenda and Modifications.

E. Record Documents and Shop Drawings: Legibly mark each item to record actual construction including:
1. Measured depths of foundations in relation to finish floor datum.
2. Measured horizontal and vertical locations of underground utilities and appurtenances, referenced to permanent surface improvements.
3. Measured locations of internal utilities and appurtenances concealed in construction, referenced to visible and accessible features of the Work.
4. Field changes of dimension and detail.
5. Details not on original Contract Drawings.

F. Architect will arrange for the Contractor to obtain reproducibles for transfer of Contractor design/build drawings and record drawing information by the Contractor. Cost of Vellum reproducibles will be paid by the Contractor. Final certified "As-Built" reproducible Vellum shall be submitted by the Contractor to the Architect before final payment is requested.

G. Delete Architect title block and seal from all documents.

H. Submit documents to Architect with claim for final Application for Payment.

I. Mark "As-Built" and date on documents in lower right-hand corner and provide two (2) full sets of blackline prints.

1.06 OPERATION AND MAINTENANCE DATA

A. Submit one set 15 days prior to final inspection, bound in 8-1/2 x 11 inch text pages, three D side ring capacity expansion binders with durable plastic covers.

B. Prepare binder covers with printed title "OPERATION AND MAINTENANCE INSTRUCTIONS", title of project, and subject matter of binder when multiple binders are required.

C. Prepare Table of Contents for each volume, with each Product or system description identified, typed on 24 pound white paper.

D. Internally subdivide binder contents with permanent page dividers, logically organized as described below; with tab titles clearly printed under reinforced laminated plastic tabs.
   1. Part 1: Directory, listing names, addresses, and telephone numbers of Architect, Contractor, Subcontractors, and major equipment suppliers.
   2. Part 2: Operation and maintenance instructions, arranged by system and subdivided by specification section. For each category, identify names, addresses, and telephone numbers of Subcontractors and suppliers. Identify following:
      a. Significant design criteria.
      b. List of equipment.
      c. Parts list for each component.
      d. Operating instructions.
      e. Maintenance instructions for equipment and systems.
      f. Maintenance instructions for special finishes, including recommended cleaning methods and materials and special precautions identifying detrimental agents.

   3. Part 3: Project documents and certificates, including following:
      a. Shop drawings and product data.
      b. Air and water balance reports.
      c. Certificates.
      d. Photocopies of warranties and bonds.
      e. List of spare parts and maintenance materials.

E. Submit three (3) final volumes, within ten days prior to final Application for Payment and after final inspection.

1.07 WARRANTIES

A. Provide duplicate notarized copies.

B. Execute and assemble documents from Subcontractors, suppliers, and manufacturers.

C. Provide binder cover, Table of Contents, tabulated list of products, beginning date and expiration date for warranties and name and address of party to contact in case of claim against warranty. Assemble with warranties in three D side ring binder with durable plastic cover.

D. Submit prior to final Application for Payment.

E. For items of Work delayed beyond date of Substantial Completion, provide updated submittal within ten days after acceptance, listing date of acceptance as start of warranty period.

1.08 SPARE PARTS AND MAINTENANCE MATERIALS

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

B. Deliver to Owner's storage area and place in location as directed; obtain receipt prior to final payment.

C. Tabulate list of spare parts and maintenance materials. Indicate product description, Specifications paragraph listing product, and quantity of product delivered to Owner. Include list at end of "OPERATION AND MAINTENANCE INSTRUCTION" binder.

1.09 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. Operating and maintenance manual shall constitute the basis of instruction.
   1. Review contents of manual with Owner's personnel in full detail to explain all aspects of operations and maintenance.
   2. Review complete heating and cooling cycles with Owner's personnel. Review location of dampers, valves and control equipment.

PART 2 PRODUCTS (Not Applicable)

PART 3 EXECUTION (Not Applicable)

END OF SECTION

SECTION 03100
CONCRETE FORMWORK

PART 1 GENERAL

1.01 SUMMARY

A. Section Includes:
1. Formwork for cast-in place concrete.
2. Openings for other work.
3. Form accessories.
4. Form stripping.

B. Related Sections:
1. Section 03200 - Concrete Reinforcement.
2. Section 03300 - Cast-in-Place Concrete.
3. Appendix A - Geotechnical Report.

C. Products Installed But Not Furnished Under This Section:
1. Section 04220 - Unit Masonry: Supply of masonry accessories for placement by this Section.
2. Section 05500 - Metal Fabrications: Supply of metal fabrications for placement by this Section.
3. Division 15 - Mechanical: Supply of mechanical items for placement by this Section.
4. Division 16 - Electrical: Supply of electrical items for placement by this Section.

1.02 REFERENCES

A. American Concrete Institute (ACI):
1. ACI 301 - Specifications for Structural Concrete for Buildings.
2. ACI 318 – Building Code Requirements For Reinforced Concrete.
3. ACI 347R – Guide to Formwork for concrete.

B. Product Standard - U.S. Department of Commerce (PS):
1. PS-1 - Construction and Industrial Plywood.

1.03 DESIGN REQUIREMENTS

A. Design, engineer and construct formwork, shoring and bracing to conform to design and code requirements; resultant concrete shall conform to required shape, line and dimension.

B. Tolerances: Conform to recommendations of ACI Standards.

1.04 DELIVERY, STORAGE, AND HANDLING

A. Deliver products to Site, store, protect and handle under provisions of Section 01600.

B. Deliver void forms and installation instructions in manufacturer's packaging.

C. Store forms off ground in ventilated and protected manner to prevent deterioration from moisture.

1.05 COORDINATION

A. Coordinate work under provisions of Section 01039.

B. Coordinate this Section with other Sections of work which require attachment of components to formwork.

C. If formwork is placed after reinforcement resulting in insufficient concrete cover over reinforcement, request instructions from Architect before proceeding.

PART 2 PRODUCTS

2.01 FORM MATERIALS

A. Form Materials for Concealed Surfaces: Wood or Steel at the discretion of Contractor.

B. Form Materials for Exposed Surfaces: Plywood: Douglas Fir species; APA Structural 1, High Density Overlaid (HDO) one side grade; sound undamaged sheets with clean, true edges.
1. All material new for beginning of project.
2. Mill coat faces and seal all edges with polyurethane edge sealer; grade mark each panel. Coat plywood with Nox-Crete Form Coating, or approved substitute.
3. Determine plywood thickness required for design pressures.
4. Use largest practicable sizes to minimize joints, unless otherwise indicated.

C. Lumber: Construction grade; with grade stamp clearly visible.

2.02 FORMWORK ACCESSORIES

A. Form Ties: Removable type, adjustable in length to permit tightening of forms and not have any lugs, cones, washers to act as spreader within form, nor leave a hole larger than ¾ inch diameter, or a depression in exposed concrete surface, or leave metal closer ½ inches to concrete surface. Wire ties not permitted. Cutting ties back from concrete face not permitted.

B. Form Release Agent: Colorless mineral oil which will not stain concrete, absorb moisture, or impair natural bonding or color characteristics of coating intended for use on concrete; MagicKote, Nox-Crete, Burke Release, or equal.

C. Chamfer Strip: Burke Concrete Accessories, or equal.

D. Vinyl Reglets: Extruded vinyl with covered face or filled to prevent intrusion of concrete or debris.

E. Nails, Spikes, Lag Bolts, Through Bolts, Anchorages: Sized as required, of sufficient strength and character to maintain formwork in place while placing concrete.

[F. Round Column Form: Sleek/tubes, seamless standard wall, manufactured by Smurfit Corporation, or equal.]

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify lines, levels and centers before proceeding with formwork. Ensure that dimensions agree with Drawings.

3.02 EARTH FORMS

A. Earth forms are not permitted, except as specially noted on the structural drawings or required by soil report.

3.03 FORMWORK

A. Standard Specifications: Construct formwork to comply with ACI 301 and ACI 347R.

B. Erect, support, brace, and maintain formwork to safely support vertical and lateral loads that might be applied, until such loads can be supported by concrete.

C. Construct forms to support assumed values of live load, dead load, ambient temperature, soil pressures, seismic stresses, and other factors pertinent to safely during construction.

D. Construct formwork to be readily removable without impact, shock, or damage to cast-in-place concrete surfaces and adjacent materials.

E. Construct forms to obtain concrete sizes and shapes shown on Drawings. Adjust forms to obtain accurate alignment and level and plumb work. Verify field dimensions and elevations.

F. Fabricate forms for easy removal without hammering or prying against concrete surfaces.

G. Bevel or kerf wood inserts for forming keyways and recesses to assure easy removal.

H. Where interior area of formwork is inaccessible, provide temporary openings for cleanout and inspection before concrete placement.

I. Locate temporary openings on forms in as inconspicuous a location as possible. Brace temporary closures and set tight to forms to prevent loss of concrete mortar.

3.04 FORMWORK FOR EXPOSED CONCRETE

A. Drill forms to suit ties used and to prevent leakage of concrete mortar around tie holes.

B. Do not use patched form facing material for exposed concrete surfaces.

C. Provide sharp, clean corners at intersecting planes, without visible edges or offsets. Back joints with extra studs or girts to maintain true, square intersections.

D. Use extra studs, walers, and bracing to prevent bowing of forms between studs and to avoid bowed appearance in concrete.

E. Form molding shapes, recesses and projections with smooth-finish materials, and install in forms with sealed joints to prevent displacement.

F. Do not end grain of plywood and end grain of wood form boards as forming surfaces.

3.05 APPLICATION - FORM RELEASE AGENT

A. Apply form release agent on formwork in accordance with manufacturer's recommendations.

B. Apply prior to placement of reinforcing steel, anchoring devices, and embedded items.

C. Do not apply form release agent where concrete surfaces will receive special finishes or applied coverings which are effected by agent. Soak inside surfaces of untreated forms with clean water. Keep surfaces coated prior to placement of concrete.

3.06 INSERTS, EMBEDDED PARTS, AND OPENINGS

A. Provide formed openings where required for items scheduled to be embedded in or passing through concrete work.

B. Locate and set in place items scheduled to be cast directly into concrete.

C. Coordinate work of other Sections in forming and placing openings, slots, reglets, recesses, chases, sleeves, bolts, anchors, and other inserts. Use settings diagrams, templates, and instructions by others for locating and setting embedments.

D. Provide opening in formwork for penetrating materials. Accurately place and securely support items built into forms.

E. Install accessories in accordance with manufacturer's instructions and requirements of Regulatory Agencies, straight, level, and plumb. Ensure items are not disturbed during concrete placement.

3.07 SLEEVES

A. Contractor to verify, coordinate, and be responsible for locating and placing sleeves for mechanical, electrical, plumbing, fire protection, landscape, irrigation lines that penetrate concrete elements.

3.08 SHORING CONSTRUCTION

A. Construct shoring to safely support the work without excessive stress or deflection. Make shoring adjustable to correct for settlement during concrete placement.

B. Keep shores in place until the concrete has attained its required strength and heavy loads due to construction operations have been removed.

C. Remove shores in planned sequence to avoid damage to partially cured concrete.

3.09 FORM CLEANING

A. Clean and remove foreign matter within forms as erection proceeds.

B. Clean formed cavities of debris prior to placing concrete.

C. Flush with water or use compressed air to remove remaining foreign matter. Ensure that water and debris drain to exterior through clean-out ports.

D. During cold weather, remove ice and snow from within forms. Do not use de-icing salts or water to clean out forms, unless formwork and concrete construction proceed within heat enclosure. Use compressed air or other means to remove foreign matter.

3.10 FORMWORK TOLERANCES

A. Construct formwork to maintain tolerances required by ACI 301 and 347R.

3.11 FIELD QUALITY CONTROL

A. Inspect erected formwork, shoring, and bracing to ensure that work is in accordance with formwork design, and that supports, fastenings, wedges, ties, and items are secure.

B. Do not reuse wood formwork for concrete surfaces scheduled to be exposed to view. Do not patch formwork utilized to construct concrete exposed to view.

3.12 FORM REMOVAL

A. Do not remove forms or bracing until concrete has gained sufficient strength to carry its own weight and imposed construction and design loads.

B. Remove forms in accordance with requirements of ACI 318, except do not remove any forms before expiration of following times from time of concrete placement.
   1. Footings: 24 hours.

   2. To facilitate float finishing of formed surfaces, remove forms at earliest time practicable without possibility of injury to concrete.

C. Loosen forms carefully. Do not wedge pry bars, hammers, or tools against finish concrete surfaces scheduled for exposure to view.

END OF SECTION

SECTION 03200
CONCRETE REINFORCEMENT

PART 1 GENERAL

1.01 SUMMARY

A. Section Includes:
1. Reinforcement and accessories for cast-in-place concrete.

B. Related Sections:
1. Section 03100 - Concrete Formwork.
2. Section 03300 - Cast-in-Place Concrete.
3. Section 04220 - Unit Masonry: Reinforcement.
4. Appendix A - Geotechnical Report

1.02 REFERENCES

A. American Concrete Institute (ACI):
1. ACI 301 - Structural Concrete for Buildings.
2. ACI 318 - Building Code Requirements For Reinforced Concrete.
3. ACI SP-66 - American Concrete Institute - Detailing Manual.

B. American Society for Testing and Materials (ANSI/ASTM):
1. ASTM A82 - Cold Drawn Steel Wire for Concrete Reinforcement.
2. ASTM A185 - Welded Steel Wire Fabric for Concrete Reinforcement.

C. American Society for Testing and Materials (ASTM):
1. ASTM A615 - Deformed and Plain Billet Steel Bars for Concrete Reinforcement.

D. Concrete Reinforcing Steel Institute (CRSI):
1. CRSI - Concrete Reinforcing Steel Institute Manual of Practice.
2. CRSI 63 - Recommended Practice For Placing Reinforcing Bars.
3. CRSI 65 - Recommended Practice For Placing Bar Supports, Specifications and Nomenclature.

1.03 SUBMITTALS

A. Submit under provisions of Section 01300.

B. Shop Drawings: Indicate sizes, spacings, locations, and quantities of reinforcing steel and wire fabric, bending and cutting schedules, and supporting and spacing devices.

1.04 QUALITY ASSURANCE

A. Perform Work in accordance with ACI 301, ACI SP-66, ACI 318.

1.05 COORDINATION

A. Coordinate work under provisions of Section 01039.

B. Coordinate with placement of formwork, formed openings and other Work.

PART 2 PRODUCTS

2.01 REINFORCEMENT

A. Reinforcing Steel: ASTM A615; deformed billet steel bars, plain finish.

2.02 ACCESSORY MATERIALS

A. Tie Wire: Minimum 16 gage annealed type.

B. Chairs, Bolsters, Bar Supports, Spacers: Sized and shaped for strength and support of reinforcement during concrete placement conditions.

2.03 FABRICATION

A. Fabricate concrete reinforcing in accordance with ACI 318.
   1. Do not heat bars for bending.
   2. Bars with offsets or bends not conforming to Drawings will be rejected.

B. Locate reinforcing splices, at point of minimum stress. Review location of splices with Structural Engineer.

PART 3 EXECUTION

3.01 PLACEMENT

A. Place, support and secure reinforcement against displacement. Place in conformance with ACI 318. Do not deviate from required position.

B. Accommodate placement of formed openings.

C. Laps as specified in structural drawings.

D. Avoid damage to vapor barrier membrane.

E. Clean reinforcement of loose scale or other deleterious material.

F. Locate and support with metal chairs, runners, bolsters, spacers, and hangers as required.

G. Set wire ties so ends are directed into concrete, not toward surfaces.

H. Provide not less than following reinforcement unless otherwise indicated on the Structural Drawings:
   1. All concrete: Minimum 0.0025 times cross-sectional area of concrete in each direction.

2. Corner bars: Same size, quantity, and spacing as horizontal reinforcement at wall and footing corners and intersections.

I. Maintain concrete cover around reinforcing as noted on the structural drawings.

3.02 FIELD QUALITY CONTROL

A. Field inspection will be performed under provisions of Section 01400.

END OF SECTION

SECTION 03300
CAST-IN-PLACE CONCRETE

PART 1 GENERAL

1.01 SUMMARY

A. Section Includes:
1. Cast-in-place concrete footings, foundation walls, and retaining walls.
2. Floors slabs on grade, and exterior concrete walks and exterior miscellaneous slabs.
3. Expansion and contraction joint devices associated with concrete work.

B. Related Sections:
1. Section 01400 - Quality Control Testing
2. Section 01410 - Testing Laboratory Services
3. Section 02200 - Earthwork
4. Section 03100 - Concrete Formwork
5. Section 03200 - Concrete Reinforcement
6. Section 06112 - Framing and Sheathing
7. Section 07900 - Sealants
8. Section 09650 - Resilient Flooring
9. Section 09671 - Textured Floor Coatings
10. Division 15 - Mechanical
11. Division 16 – Electrical
12. Appendix A - Geotechnical Report

C. Products Furnished But Not Installed Under This Section:
1. Section 03100 - Concrete Formwork.

1.02 REFERENCES

A. American Concrete Institute (ACI):
1. ACI 117 - Standard Specifications for concrete.
2. ACI 301 - Structural Concrete.
3. ACI 304R - Recommended Practice for Measuring, Mixing, Transporting and Placing Concrete.
4. ACI 305R - Hot Weather Concreting.
5. ACI 306R - Cold Weather Concreting.
6. ACI 308 - Standard Practice for Curing Concrete.
7. ACI 309R - Guide for Consolidation of Concrete.
8. ACI 318 - Building Code Requirements for Reinforced Concrete.

B. American Society for Testing and Materials (ASTM):
1. D1751 - Preformed Expansion Joint Fillers for Concrete Paving and Structural Construction (Nonextruding and Resilient Bituminous Types).
2. ASTM C33 - Concrete Aggregates.
3. ASTM C94 - Ready-Mixed Concrete.
4. ASTM C150 - Portland Cement.
5. ASTM C260 - Air Entraining Admixtures for Concrete.

6. ASTM C494 - Chemicals Admixtures for Concrete.

1.03 SUBMITTALS

A. Submit under provisions of Section 01300.

B. Mix Proportions and Design Reports: Submit written report to Architect for each proposed concrete mix at least 10 days prior to start of work.
   1. Proportion mixes by either laboratory trial batch or field experience method, complying with ACI 301, Chapter 3.8, Method 1 or 2.
   2. Do not begin concrete production until mixes have been reviewed and are acceptable to Architect.
   3. Mix designs may be adjusted when material characteristics, job conditions, weather, test results or other circumstances warrant.
   4. Do not use revised concrete mixes until submitted to and accepted by Architect.

C. Certificate: Furnish testing agency's certification that materials furnished meet or exceed requirements of this specification.

D. Project Record Documents:
   1. Submit under provisions of Section 01700.
   2. Accurately record actual locations of embedded utilities and components which are concealed from view.

1.04 QUALITY ASSURANCE

A. Perform Work in accordance with ACI Standards.

B. Acquire cement and aggregate from same source for all work.

C. Conform to ACI 305R when concreting during hot weather.

D. Conform to ACI 306R when concreting during cold weather.

E. Field Samples:
   1. Provide under provisions of Section 01400.
   2. Construct field sample for architectural concrete surfaces receiving special treatment, color, or finish.
   3. Sample Panel: Construct one panel, 10 feet long by 10 feet wide, to indicate special treatment or finish required.
   4. Obtain Architect's acceptance of finish prior to proceeding.
   5. Accepted sample panel is considered basis of quality for finished work. Keep sample panel exposed to view for duration of concrete work.
   6. Accepted sample may remain as part of Work.

1.05 CONVEYING

A. Convey concrete from mixer to place of final deposit by methods to prevent separation or loss of materials.

1.06 PROJECT CONDITIONS

A. Place no concrete without testing unless acceptable to Architect.

B. Cold Weather Conditions: Comply with applicable provisions of ACI 306R and following:
   1. Do not place concrete when temperature is below 40 degrees F. unless acceptable to Architect.
   2. Provide adequate equipment for heating concrete materials.
   3. Protect concrete during freezing or near freezing weather.
   4. Keep free of frost all concrete materials, reinforcement, forms, fillers, and ground with which concrete is to come in contact.
   5. Do not use frozen materials or materials containing ice.

C. Hot weather conditions comply with applicable provisions of ACI 305R and following:
   1. Protect concrete to prevent excessive concrete temperatures or water evaporation which will impair required strength or serviceability of member or structure.

D. Exercise caution when placing and vibrating concrete on rigid insulation to ensure against damage and displacement.

1.07 COORDINATION

A. Coordinate work under provisions of Section 01039.

B. Coordinate the placement of joint devices with erection of concrete formwork and placement of form accessories.

PART 2 - PRODUCTS

2.01 CONCRETE MATERIALS

A. Cement: ASTM C150, Portland Type II.

B. Fine and Coarse Aggregates:
   1. Normal weight aggregate: ASTM C33.
   2. Graduation of combined aggregates shall be within the following limits:

Sieve Size	3/4" Max Agg.*
2"	100
1 ½"	100
1"	100
¾"	90-100
3/8"	60-80
#4	40-60
#8	30-45
#16	20-35
#30	12-25
#50	5-15

	#100	0-5

*(Percent Passing Sieve)

C. Water: Fresh, Clean and Potable.

2.02 ADMIXTURES

A. Air Entrainment: ASTM C260.

B. Chemical Admixtures: ASTM C494.
1. Type A - Water Reducing Admixture.

2.03 ACCESSORIES

A. Bonding Agent: Sonocrete or Sonobound by Sonneborn, Masco Bond S.B.R. or approved.

B. Non-Shrink Grout: Premixed compound consisting of non-metallic aggregate, cement, water reducing and plasticizing agents; capable of developing minimum compressive strength of 2,400 psi in 48 hours and 7,000 psi in 28 days with non-shrink grout.

C. Patching Compound: Sonopatch by Sonneborn, RAECO "R-25" and as approved by Architect and compatible with floor covering and floor covering adhesive.

D. Curing/Sealer Compound: Kure-N-Seal by Sonneborn, Mascocure Kure-N-Seal, or approved substitute at all non colored concrete.

E. Preformed Expansion Joint Devices and Filler Materials:
1. Joint Filler: ASTM D1751; Asphalt impregnated fiberboard or felt, 3/8" thick x 3 ½", manufactured by Burke or equal.

F. Joint Caps:
1. At exterior plaza expansion joints with joint sealer use removable plastic expansion joints caps, 3/8 inch deep, 3/8 inch wide; manufactured by Burke or equal.

G. Construction Joint Devices: Integral galvanized steel formed to tongue and groove profile, with removable top strip exposing sealant trough, knockout holes, ribbed steel spikes with tongue to fit top screed edge; Keyed-Kold joint manufactured by Burke, or Cardinal Form a Key or equal.

H. Exterior Concrete Sealer: Sonnenborn, Kure-N-Seal, 0800 or approved.

I. Interior saw Cut and Construction Joint Fillers: MM80 Epoxy as manufactured by Metzger/McGuire, at exposed concrete areas only. In areas where floor covering will be installed over concrete, use Edge-Pro XL in lieu of MM80. Install backer rod to 75% of joint depth before placing Edge-Pro XL joint filler. Consult with flooring manufacturer and Metzger/McGuire, (800) 223-MM80, prior to installation of joint fillers to insure compatibility with flooring materials and concrete slab requirements.

2.04 CONCRETE MIX

A. Mix concrete in accordance with ACI 301, and 304R. Deliver concrete in accordance with ASTM C94.

B. Select proportions for normal weight concrete in accordance with ACI 301.

C. Provide concrete to follow a minimum criteria or as indicated on the Structural drawings:

D. Use accelerating admixtures in cold weather only when approved by Architect. Use of admixtures will not relax cold weather placement requirements.

E. Use of calcium chloride will not be approved.

F. Use set retarding admixtures during hot weather only when approved by Architect.

G. Add air entrainment agent to mix to provide 5% +/- air entrainment for concrete exposed to freeze-thaw cycling.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify site conditions under provisions of Section 01039.

B. Verify requirements for concrete cover over reinforcement.

C. Verify that anchors, seats, plates, reinforcement and other items to be cast into concrete are accurately placed, positioned securely, and will not cause hardship in placing concrete.

3.02 PREPARATION

A. Prepare previously placed concrete by cleaning with steel brush and applying bonding agent in accordance with manufacturer's instructions.

B. In locations where new concrete is dowelled to existing work, drill holes in existing concrete, insert steel dowels adhere with epoxy or urethane resin adhesive. Approved products: Sup-R-Resin 39Z by U.S.E. Company, Epcon Ceramic G capsule anchors by Ramset Corp., Parafast Resin mortar cartige by Emhart Co., or approved.

3.03 PLACING CONCRETE

A. Place and consolidate concrete in accordance with ACI 304R, ACI 301, and ACI 318.

B. Ensure reinforcement, inserts, embedded parts, formed joint fillers, and joint devices are not disturbed during concrete placement.

C. Install joint fillers in accordance with manufacturer's instructions.

D. Extend joint filler from bottom of slab to within 3/8 inch of finished slab surface. Conform to Section 07900 for finish joint sealer requirements.

E. Install joint devices in accordance with manufacturer's instructions.

F. Install construction joints in coordination with floor slab pattern placement sequence. Set to required elevations. Secure to resist movement by wet concrete.

G. Install joint device anchors and joint dowels where required. Maintain correct position to allow joint flush with floor finish, and dowels aligned and perpendicular to joint.

H. Apply sealants in joint devices in accordance with Section 07900.

D. Maintain records of concrete placement. Record date, location, quantity, air temperature, and test samples taken.

E. Place concrete continuously between predetermined expansion, control, and construction joints.

F. Do not interrupt successive placement; do not permit cold joints to occur.

G. Sequence floor slab pours to minimize shrinkage effects.

N. During hot weather follow the recommendations of ACI 305 or as specified to prevent problems in the manufacturing, placing, and curing of concrete that can adversely affect the properties and serviceability of the hardened concrete.

O. During cold weather follow the recommendations of ACI 306 or as specified to prevent freezing of concrete and to permit concrete to gain strength properly.

P. Consolidation:
   1. Consolidate placed concrete in accordance with ACI 309 using mechanical vibrating equipment with supplemental hand rodding and tamping to work concrete around reinforcement, embedded items and into all parts of forms.
      a. Use only internal type vibrating equipment capable of maintaining minimum speed of 6000 impulses per minute when operating submerged in concrete.
      b. Use adequate number of units to properly consolidate all concrete.
   2. Operate vibrating equipment using only qualified workers under experienced supervision.
   3. Space and pattern vibrator points of application to produce visual proof of effectiveness over entire surface of concrete being placed.
      a. Insert and remove vibrators with vertical movements only and without lateral movement while immersed.
      b. Do not use vibrator to move concrete laterally.
      c. Adjust spacing of insertions to concrete mix and to provide consolidation without segregation.

Q. Saw cut joints within 24 hours after placing. Using 3/16 inch thick blade, cut as shown on the Structural Drawings.

R. Screed slabs on grade level, maintaining surface flatness of maximum 1/4 inch in 10 ft. at exterior slabs and 1/8 inch in 10 ft. at interior slabs.

S. All exposed exterior concrete shall be sealed.

T. Repair vapor barrier damaged during placement of concrete reinforcing. Repair with vapor barrier material; lap over damaged areas minimum 6 inches and seal watertight.

3.05 CONCRETE FINISHING

A. Finish concrete floor surfaces in accordance with ACI 301.

B. Provide formed concrete surfaces to be left exposed sack rubbed finish.

C. Interior Slabs:
1. Steel troweled, dense, and smooth.
2. Make minimum of two passes, but not more than necessary.
3. Finish with steel trowel flat.

D. Bullfloat entire surface of slabs to true plane.
1. Float perpendicular to screeds.
2. Complete floating before free water collects on surface.
3. After surface water, if any, has evaporated, perform, initial edging and jointing.
4. Use metal float on air-entrained concrete.

E. Do not dust surface with dry cement or sand during finishing.

H. Sealer: (See Attached Euclid Chemical Company Sealer and Joint Filler specs for Warehouse floor)
1. Following completion of work by all trades, and just prior to occupancy, apply second coat of curing compound to all exterior slabs and walkways scheduled to remain exposed.
2. Apply sealer in accordance with manufacturer's instructions.

3.06 CURING AND PROTECTION

A. Immediately after placement, protect concrete from premature drying, excessively hot or cold temperatures, and mechanical injury.

B. Maintain concrete with minimal moisture loss at relatively constant temperature for period necessary for hydration of cement and hardening of concrete.

C. Cure floor surfaces in accordance with ACI 308.
1. Place curing compound as per manufacturer recommendations.
2. Begin curing flatwork immediately after finisher has completed 300 sq. ft. maximum of work; each section of formed work as soon after placing as practical.
3. Do not use curing compounds on concrete slabs scheduled to receive ceramic

tile.

4. Verify compatibility of curing compounds with flooring materials manufacture prior to installation.

D. Protection:
   1. Cover and protect all permanently exposed concrete with heavy, non-staining kraft paper unless otherwise indicated.
   2. Use planks or plywood on slabs at points of heavy traffic where surfaces remain permanently exposed.
   3. Protect concrete surfaces to remain exposed from other concrete, mortar, cleaning of other construction, application of bituminous materials and from scarring or other damage.
   4. Do not permit rain water or water used in curing, to wash down over faces of exposed concrete.

3.07 FIELD QUALITY CONTROL

A. Field inspection and testing will be performed in accordance with ACI 301 and under provisions of Section 01400.

B. Provide free access to Work and cooperate with appointed firm.

C. Submit proposed mix design of each class of concrete to testing firm for review prior to commencement of Work.

D. Tests of cement and aggregates may be performed to ensure conformance with specified requirements.

E. Three concrete test cylinders will be taken for every 50 yards or less for each class of concrete placed.

F. One additional test cylinder will be taken during cold weather concreting, cured on job site under same conditions as concrete it represents.

G. One slump test will be taken for each set of test cylinders taken.

3.08 PATCHING

A. Notify Architect to review concrete surfaces immediately upon removal of forms.

B. Excessive honeycomb or embedded debris in concrete is not acceptable. Notify Architect upon discovery.

C. Patch imperfections as directed by Architect in accordance with ACI 301.

3.09 DEFECTIVE CONCRETE

A. Definition of Defective Concrete: Concrete not conforming to required lines, details,

dimensions, tolerances, consistent color, or specified requirements.

B. Repair or replacement of defective concrete will be determined by Architect.

C. Do not patch, fill, touch-up, repair, or replace exposed concrete except upon express direction of Architect for each individual area.

D. Remove from Project all concrete which:
1. Does not meet or exceed specified requirements.
2. Contains shrinkage cracks closer than 15 ft. o.c.
3. Contains wood, debris, or other foreign matter.
4. Contains voids or rock pockets.
5. Is not true to intended shape, alignment, grade, color, finish, and texture.
6. Is not plumb and level where so intended.

3.10 EQUIPMENT BASES AND FOUNDATIONS

A. Miscellaneous Concrete Items: Provide as detailed, and form to proper heights and area. Finish top surfaces with smooth integral cement finish. Apply steel trowel finish to bases, except where schedule to receive other finishes. Bases are sized for specified equipment. If equipment is modified by Contractor thus requiring modification in base sizes, such modification shall be made at no increase in the Contract Amount.

B. Filling In: Fill in holes, voids and openings left in concrete for passage of work by other trades, unless otherwise shown or directed. Mix, place and cure concrete to blend in with the concrete already in place.

3.11 SURFACE REPAIRS

A. Remove fins and projections. Thoroughly clean with water and brush-coat the area to be patched with specified grout or patching compound.

B. Fill honeycomb voids and rock pockets with patching compound in proportions as recommended by specified manufacturer.

C. Prepare grout or patching compound to match color and texture of adjacent concrete when dry. Compact material well in place, screed slightly higher than surrounding surface, allow one to two hours for initial shrinkage, finish to match adjoining work, striking off excess mortar at surface.

D. If defects cannot be repaired, remove and replace the concrete.

E. Provide patching compound over interior concrete slabs which, in Architect's opinion, are rough or uneven to provide a satisfactory base for floor coverings.

F. Grind down edges and rough slab edges to receive flooring.

3.12 CLEANING

A. All exposed concrete surface to be thoroughly cleaned prior to acceptance of finish

construction.

END OF SECTION

SECTION 04100
MORTAR

PART 1 - GENERAL

1.01 SUMMARY

A. Section Includes:
1. Mortar and grout for masonry.

B. Related Work:
1. Section 01400 - Quality Control.
2. Section 01410 - Testing Laboratory Services.
3. Section 04220 - Unit Masonry.
4. Section 14210 - Elevator

1.02 REFERENCES

A. American Society for Testing and Materials (ASTM):
1. ASTM C94 - Ready-Mixed Concrete.
2. ASTM C144 - Aggregate for Masonry Mortar.
3. ASTM C150 - Portland Cement.
4. ASTM C207 - Hydrated Lime for Masonry Purposes.
5. ASTM C270 - Mortar for Unit Masonry.
6. ASTM C387 - Packaged, Dry, Combined Materials, for Mortar and Concrete.
7. ASTM C404 - Aggregates for Masonry Grout.
8. ASTM C476 - Grout for Masonry.
9. ASTM C780 - Preconstruction and Construction Evaluation of Mortars for Plain and Reinforced Unit Masonry.
10. ASTM C1019 - Method of Sampling and Testing Grout.

B. International Masonry Industry All-Weather Council (IMIAC):
1. Recommended Practices and Guide Specifications for Hot or Cold Weather Masonry Construction.

C. Reinforced Concrete Masonry Construction Inspectors Handbook: Recommended practices for masonry construction.

1.03 DELIVERY, STORAGE, AND HANDLING

A. Deliver products to site, store and protect under provisions of Section 01600.

B. Maintain packaged materials clean, dry, and protected against dampness, freezing, and foreign matter.

1.04 ENVIRONMENTAL REQUIREMENTS

A. Perform masonry work in accordance with the International Masonry Industry All-Weather Council (IMIAC) Recommended Practices and Guide Specifications for Cold Weather Masonry Construction.

B. Wet Weather: Provide suitable cover over work exposed to weather. Maintain cover over finished work until application of sealer applied and cap flashing installed.

C. Cold Weather: When outside temperature is below 40 degrees F. or is expected to fall below freezing within 48 hours (Weather Bureau Forecast), heat materials and provide suitable enclosures to maintain temperatures exceeding 40 degrees F. in masonry work in place for 48 hours after completion. Obtain approval of methods of protection before proceeding.

1.05 MIX TESTS

A. Test mortar in accordance with ASTM C780.

B. Test mortar in accordance with ASTM C780.

C. Testing of Grout Mix: In accordance with ASTM C1019.

1.06 WARRANTY: Provide five (5) year written warranty on materials and workmanship.

PART 2 - PRODUCTS

2.01 MATERIALS

A. Portland Cement: ASTM C150, Type I gray color.

B. Mortar Aggregate: ASTM C144, standard masonry type.

C. Hydrated Lime: ASTM C207, Type S.

D. Premix Mortar: ASTM C387, using gray cement, Normal strength.

E. Grout Aggregate: ASTM C404.

F. Water: Clean and potable.

G. Sand: ASTM C144

H. Mortar Color: Provide Davis Mortar color as selected at Brick Masonry Units only. Integral color mortar 3 – 5 lbs/ sack range will be used at Brick only and natural gray Mortar will be used at Concrete Masonry Units.

2.02 ADMIXTURES

A. Plasticizer for Grout: Water reducing type which reduces porosity and absorption to increase bond strength; Grout Aid manufactured by Sika.

B. At all integrally colored block provide 'Dry-Block' mortar additive by W.R. Grace at a rate as recommended by manufacturer.

2.03 MORTAR MIXES

A. Mortar for Walls and Partitions: ASTM C270, Type S utilizing Proportion Method to achieve 1,800 psi. strength, or as indicated on Drawings.

2.04 MORTAR MIXING

A. Thoroughly mix mortar ingredients in quantities needed for immediate use in accordance with ASTM C270 and C780.

B. Mix mortar by mechanical equipment only.

C. Do not use anti-freeze compounds to lower freezing point of mortar.

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

E. Use mortar within two hours after mixing at temperatures of 80 degrees F, or two-and-one-half hours at temperatures under 50 degrees F.

2.05 GROUT MIXES

A. Bond Beams, Lintels, etc. 2000 psi strength at 28 days; 9-11 inches slump; premixed type in accordance with ASTM C94.

2.06 GROUT MIXING

A. Mix concrete in accordance with ASTM C94.

B. Add admixtures in accordance with manufacturer's instructions. Provide uniformity of mix.

C. Do not use anti-freeze compounds to lower freezing point of grout.

PART 3 - EXECUTION

3.01 PREPARATION

A. Clean existing adjacent masonry surfaces of loose mortar.

B. Protect existing adjacent surfaces from mortar stains.

3.02 INSTALLATION

A. Install grout in accordance with manufacturer's instructions.

B. Install mortar and grout to requirements of specific masonry Sections.

C. Accessory Placement: Embed concealed flashing and masonry accessories as indicated and required.

D. Mortar Setting: Do not use mortar which has begun to set or is beyond the

recommended elapsed time since initial mixing. Retemper mortar during the recommended elapsed time period only to restore workability.

E. Work grout into masonry cores and cavities to eliminate voids.

F. Do not displace reinforcement while placing grout.

G. Remove grout spaces of excess mortar.

3.03 FIELD QUALITY CONTROL:

A. Compressive Strength: ASTM C 109, 1,800 psi at 28 days.

3.04 ADJUSTING AND CLEANING

A. Adjusting: Remove mortar from masonry unit cavities where solid grout is required. Remove and reinstall masonry units not in alignment or not bonded by mortar.

B. Joint Repair: Rake and re-point masonry joints where directed.

C. Cleaning: Remove excess mortar from the site.

END OF SECTION

SECTION 04220
UNIT MASONRY

PART 1 - GENERAL

1.01 SUMMARY

A. Section Includes:
   1. Concrete masonry units.
   2. Reinforcement, anchorage, and accessories.

B. Related Sections:
   1. Section 01400 - Quality Control: Testing Services.
   2. Section 01410 - Testing Laboratory Services.
   3. Section 04100 - Mortar: Mortar and Grout.
   4. Section 07120 - Fluid Applied Elastomeric Waterproofing.
   5. Section 07900 - Sealant.
   6. Section 09900 - Paint
   7. Section 14210 - Elevator

C. Products Installed but not Furnished Under this Section:
   1. Section 05500 - Metal Fabrications: Placement miscellaneous fabricated steel items.
   2. Section 07600 - Flashing and Sheet Metal: Placement of reglets for flashings.

1.02 REFERENCES

A. American Society for Testing and Materials (ASTM):
   1. ASTM A123 - Zinc (Galvanized) Coatings on Iron and Steel Products.
   2. ASTM A615 - Deformed and Plain Billet Steel Bars for Concrete Reinforcement.
   3. ASTM C90 - Hollow Load Bearing Concrete Masonry Units.
   4. ASTM C145 - Solid Load Bearing Concrete Masonry Units.

B. International Masonry Industry All-Weather Council (IMIAC):
   1. IMIAC Recommended Practices and Guide Specification for Cold Weather Masonry Construction.

C. Reinforced Concrete Masonry Construction Inspectors Handbook: Recommended practices for hot and cold weather masonry construction.

1.03 QUALITY ASSURANCE

A. Installer: Company specializing in performing work of this Section with minimum three years documented experience with projects of comparable size and type.

B. Design Strength:
   1. Concrete Masonry Unit: Fm' = 1,500 psi and special inspection shall be required.
   2. Fm' shall be established prior to start of construction by prism testing according to the building code.

C. Prism Tests during Construction:
   1. Construct 3 fully grouted prisms for each 5,000 square feet of wall area.
   2. Prism tests shall be in addition to mortar and grout tests specified elsewhere.
   3. Testing of prisms: In accordance with ASTM E447-84.

1.04 DELIVERY, STORAGE, AND HANDLING

A. Deliver products to Site, store and protect under provisions of Section 01600.

B. Deliver units on covered pallets.

C. Accept masonry units on site. Inspect for damage.

1.05 PROJECT CONDITIONS

A. Perform masonry work in accordance with the International Masonry Industry All-Weather Council (IMIAC) Recommended Practices and Guide Specifications for Cold Weather Masonry Construction.

B. Wet Weather: Provide suitable cover over work exposed to weather. Maintain cover over finished work until application of sealer applied and cap flashing installed.

C. Cold Weather: When outside temperature is below 40 degrees F. or is expected to fall below freezing within 48 hours (Weather Bureau Forecast), heat materials and provide suitable enclosures to maintain temperatures exceeding 40 degrees F. in masonry work in place for 48 hours after completion. Obtain approval of methods of protection before proceeding.

1.06 SEQUENCING AND SCHEDULING

A. Coordinate work under provisions of Section 01039.

1.07 WARRANTY: Provide five (5) year written warranty on materials and workmanship.

PART 2 - PRODUCTS

2.01 MANUFACTURERS

A. Acceptable Concrete Masonry Unit Manufacturers:
   1. Mutual Materials Co.

B. Substitutions: Under provisions of Section 01600.

2.02 MATERIALS

A. Concrete Masonry Units:
   1. Hollow Load Bearing Block Units: ASTM C90, Medium Weight.
   2. Block Units: Split Face, Ground Face, Smooth Face, and Single Score.
   3. Concrete Masonry Units Size:
      a. Nominal modular size as noted in schedule at end of section. Provide

special units for 90 degree corners, bond beams, lintels, and any other sizes or shapes as required.

b. Strength: Average of 3 units not less that 2100 psi, with individual units not less than 1900 psi or as required to achieve a prism strength of fm' = 1700 psi.

c. Weight: Dry unit net weight at painted units at 105 to 125 pounds per cubic foot.

C. Reinforcement and Anchorage:

1. Reinforcing Steel: ASTM A615, 60 ksi yield grade, deformed billet bars, unprotected finish.
2. Masonry Rebar Positioner: As manufactured by A.A. Wire Products Company or approved.

2.03 ACCESSORIES

A. Metal Lath: 3.4 lb. galvanized diamond mesh, self-furring or approved.

B. Steel Jamb Anchors: Type A and Web-Tie Flex-o-Lock by A.A. Wire Products Co., or approved.

2.04 CLEANING SOLUTIONS

A. Concrete Masonry Units: Fabrikleen Type 'V' Masonry Cleaner, or approved equal. Clean and wash all exposed surfaces as recommended by the manufacturer and block supplier.

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. Beginning of installation means installer accepts existing conditions.

3.02 PREPARATION

A. Direct and coordinate placement of metal anchors supplied to other Sections.

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

3.03 INSTALLATION

A. Standards: Comply with the Latest Edition of the building code.

B. Unit Cutting: Cut as required for openings and joints.

C. Unit Placement:
   1. Install units plumb and true.
   2. Use special units where required.
   3. Set units flush on exposed side of wall and allow variation in unit thickness to run on concealed face of wall.
   4. Where masonry wall is scheduled to be painted on interior side of wall, provide least amount of variation between units possible for even wall surface.

D. Joint Size and Profile:
   1. Concrete Masonry Units: 3/8" thick, tooled concave joint at all concrete masonry.

E. Temporary Framework: Provide temporary support until masonry walls develop required strength.

F. Grouting: Place grout in masonry units with low-lift grouting techniques.

3.04 PLACING AND BONDING

A. Coursing:
   1. Establish lines, levels, and coursing indicated. Protect from displacement.
   2. Maintain masonry courses to uniform dimension. Form vertical and horizontal joints of uniform thickness.
   3. Lay masonry units in running bond. Course one unit and one mortar joint to equal 8 inches. Form concave tooled mortar joints at both faces of wall.

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

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

H. Isolate masonry partitions from vertical structural framing members as indicated.

I. Tolerances:
   1. Maximum Variation From Unit to Adjacent Unit: 1/32 inch.
   2. Maximum Variation From Plane of Wall: 1/4 inch in 10 feet and 1/2 inch in 20 feet or more.
   3. Maximum Variation From Plumb: 1/4 inch in 10 feet non-cumulative; 1/2 inch in two stories or more.

4. Maximum Variation From Level Coursing: 1/8 inch in 3 feet and 1/4 inch in 10 feet.
5. Maximum Variation of Joint Thickness: 1/8 inch in 3 feet.
6. Maximum Variation From Cross Sectional Thickness of Walls: 1/4 inch.

J. At the end of each day, cover all masonry work with flashing to protect wall from water migration during construction.

3.05 REINFORCEMENT AND ANCHORAGES - REINFORCED UNIT MASONRY:

A. Rebar Inspection: Reject bars with reduced cross section or bends not shown on shop drawings.

B. Reinforcing: Place reinforcing as indicated on Structural Drawings. Secure vertical bars with bar positioners at 4'-0" o.c.

C. Anchors and Inserts: Install where detailed. Install reglets in mortar joints where flashing meets masonry.

D. Metal Lath: Place lath under bond beams over non- reinforced vertical cells.

E. Concealed Masonry Flashing: Place where detailed and required to protect wall from moisture penetration.

3.06 GROUTED COMPONENTS

A. Provide as indicated on Drawings.

3.07 BUILT-IN WORK

A. Anchors and Inserts: Install where detailed. Install reglets in mortar joints where flashing meets masonry.

B. Metal Lath: Place lath under bond beams over non-reinforced vertical cells.

C. Concealed flashing: Place where detailed and required to protect wall from moisture penetration.

D. As work progresses, build in metal door frames anchor bolts plates and other items furnished by other Sections.

E. Build in items plumb and level.

F. Bed anchors of metal door frames in adjacent mortar joints. Fill frame voids solid with grout. Fill adjacent masonry cores with grout minimum 12 inches from framed openings.

G. Do not build in organic materials subject to deterioration.

3.08 CUTTING AND FITTING

A. Cut and fit for chases, pipes, conduit, and sleeves. Coordinate with other Sections of work to provide correct size, shape, and location.

B. Obtain Architect's approval prior to cutting or fitting masonry work not indicated or where appearance or strength of masonry work may be impaired.

3.09 CLEANING

A. Clean work under provisions of Section 01700.

B. Remove excess mortar and mortar smears.

C. Replace defective mortar. Match adjacent work.

D. Clean soiled surfaces with cleaning solution.

E. Use non-metallic tools in cleaning operations.

F. Clean and wash all exposed masonry unit surfaces with masonry cleaner. Interior surfaces to be rinsed with neutral solution of ammonia and water. All work to be left in clean and serviceable condition, and ready for interior finishes.

3.10 PROTECTION OF FINISHED WORK

A. Protect finished installation under provisions of Section 01500.

B. Without damaging completed work, provide protective boards at exposed external corners which may be damaged by construction activities.

C. Cover and protect all wall areas completed at the end of each day.

3.11 ADJUSTING AND CLEANING

A. Remove misplaced, broken or unbonded masonry units.

B. Clean masonry units as directed.

END OF SECTION

SECTION 05120
STRUCTURAL STEEL

PART 1 GENERAL

1.01 SUMMARY

A. Section Includes:
1. Structural steel framing members, baseplates and support members.
2. Grouting under baseplates.
3. Priming for finish painting.

B. Related Sections:
1. Section 05500 - Metal Fabrications: Non-framing fabrications affecting structural steel work.
2. Section 06112 - Framing and Sheathing.
3. Section 09900 - Painting: Finish painting.

C. Products Furnished but not Installed Under this Section:
1. Section 03100 - Concrete Formwork: Anchors for casting into concrete.
2. Section 04220 - Unit Masonry: Anchors for embedding into masonry.

1.02 REFERENCES

A. American Institute of Steel Construction (AISC):
1. AISC - Specification for the Design, Fabrication and Erection of Structural Steel for Buildings.

B. American Society for Testing and Materials (ASTM):
1. ASTM A572 - Structural Steel.
2. ASTM A53 - Hot-Dipped, Zinc-coated Welded and Seamless Steel Pipe.
3. ASTM A108 - Steel Bars, Carbon, Cold-Finished, Standard Quality.
4. ASTM A123 - Zinc (Hot Dipped Galvanized) Coatings on Iron and Steel Products.
5. ASTM A153 - Zinc Coating (Hot Dip) on Iron and Steel Hardware.
6. ASTM A307 - Carbon Steel Externally Threaded Standard Fasteners.
7. ASTM A500 - Cold-Formed Welded and Seamless Carbon Steel Structural Tubing in Round and Shapes.
8. ASTM A375 - High Strength bolts.

C. American Welding Society (AWS):
1. AWS A2.0 - Standard Welding Symbols.
2. AWS D1.1 - Structural Welding Code.

D. Steel Structures Painting Council (SSPC):
1. SSPC Painting Manual, Volume II, Systems and Specifications.

1.03 SUBMITTALS

A. Submit under provisions of Section 01300.

B. Shop Drawings:

1. Indicate profiles, sizes, spacing, and locations of structural members.
2. Connections. Distinguish between Shop and Field Connections.
2. Indicate welded connections with AWS A2.0 welding symbols. Indicate net weld lengths.
4. Paint and painting data.

1.04 QUALITY ASSURANCE

A. Fabricate structural steel members in accordance with AISC-Specification for the Design, Fabrication and Erection of Structural Steel for Buildings.

B. At exposed steel perform work in accordance with AISC - Specification for Architectural Exposed Structural Steel.

C. Design connections not detailed on Drawings under direct supervision of Professional Structural Engineer experienced in design of this work and licensed at place where Project is located.

D. Qualifications:
1. Fabricator Qualifications: Company specializing in performing work of this Section with minimum 3 years documented experience.
2. Erector Qualifications: Company specializing in performing work of this Section with minimum 3 years documented experience.

1.06 FIELD MEASUREMENTS

A. Verify that field measurements are as shown on drawings. Notify Architect and Structural Engineer of discrepancies immediately.

PART 2 PRODUCTS

2.01 MATERIALS

A. Structural Steel Members, Shapes and Bars: ASTM A572.

B. Structural Steel Tubing: ASTM A500, Grade B.

C. Steel Pipe: ASTM A53, Grade B.

D. Bolts, Nuts, and Washers.

E. Welding Materials: AWS D1.1; type required for materials being welded.
1. Welding Electrodes: E70XX, unless otherwise noted.

F. Grout: Non-shrink type, ASTM C827, pre-mixed compound consisting of non-metallic aggregate, cement, water reducing and plasticizing additives, capable of developing minimum compressive strength of 7,000 psi at 28 days; Five Star Grout, Fosroc Conbextra, Target Portland expanding grout or approved substitute.

G. Shop and Touch-Up Primer: SSPC Paint 15, Type 1, red oxide.

H. Connection: Fabrication of welded construction, drill and tap as required to receive hardware and similar items. Include required anchors for building into other work.

I. Structural Connectors: Furnish custom fabricated bolts, plates, tie rods, anchors, dowels, and other steel shapes for framing, supporting, and anchoring framing.

J. Loose Bearing Plates: Provide for framing members bearing on masonry or concrete as indicated.

2.02 FABRICATION

A. Shop-fabricate all work in complete units where possible.

B. Verify and be responsible for exact field measurements as required for fabricated work to fit job conditions.

C. Camber steel girders and beams as indicated.

D. Perform all necessary cutting, punching, drilling and tapping required for:
1. Attachment of other work coming in contact with structural steel.
2. Where indicated or where directions for same are given prior to or with review of Shop Drawings.
3. Unless otherwise indicated, make bolt holes 1/16 inch larger than required fastener diameter.

E. Except where indicated, perform no field cutting or burning.

F. Form work true to detail with clean, straight, sharply detailed profiles.
1. Make exposed joints close fitting and where least conspicuous.
2. Have field connections, other than shown on Drawings, accepted by Architect.

G. Welding:
1. Continuously seal joined members by continuous welds.
2. Grind exposed welds smooth, flush and ready for paint finish.

2.03 FINISH

A. Prepare structural component surfaces in accordance with SSPC SP-2.

B. Shop prime structural steel members with one coat of primer. Do not prime surfaces that will be field welded or in contact with concrete.

C. Galvanize structure components exposed to weather to shop prime G-90 standard.

PART 3 EXECUTION

3.01 EXAMINATION

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

Architect of conditions detrimental to proper and timely completion of work.

B. Beginning of installation means erector accepts existing conditions.

3.02 ERECTION

A. Field Assembly:
   1. Assemble steel to lines and elevations indicated, within tolerances specified by AISC Specifications and Code of Standard Practice.
   2. Provide holes in members to permit connecting work of other trades when furnished with templates or required information.
   3. Bring assembled parts into close contact.
   4. Use drift pins only to positions members.
   5. Do not enlarge or distort holes.
   6. Where required for proper alignment, provide short slotted holes.

B. Temporary Bracing: Allow for erection loads, and for sufficient temporary bracing to maintain structure safe, plumb, and in true alignment until completion of erection and installation of permanent bracing.

C. Field Connections:
   1. Provide bolted connections, except where welded connections are indicated, as follows:
      a. Use high strength threaded fasteners where indicated on Structural Drawings.
      b. Tighten nuts of high strength bolted connections, with properly calibrated wrenches, to not less than minimum bolt tension, for size of bolt used, in accordance with AISC requirements. Check each calibrated wrench at least once daily for accuracy under actual conditions of application.
      c. Mark completely tightened bolts with identifying symbol.
   2. Field weld components and shear studs indicated on Drawings.

D. Do not field cut or alter structural members without approval of Architect/Engineer. Field correction of fabrication errors by gas cutting torch is NOT permitted without Architect's written acceptance.

E. Base Plates and Bearing Plates:
   1. Support attached column bases with wedges or shims of type and in manner to permit installation of grout without interference or necessity for removal of wedges or shims.
   2. Support base plates and large bearing plates on steel wedges or shims until support members have been plumbed, Grout solid entire bearing area after plumbing.
   3. Mix place and cure grout in accordance with manufacturer's instructions.

F. Erection Tolerances:
   1. Maximum Variation From Plumb: 1/4 inch in 10 feet, non-cumulative.
   2. Maximum Offset From True Alignment: 1/4 inch.

3.03 PAINTING

A. Thoroughly clean surfaces of all dirt, rust, grease and loose mill scale in conformance with requirements with SSPC-SP3 Power Tool Cleaning.

B. Shop apply one prime coat on all steel surfaces except as otherwise specified.
   1. Do not paint surface:
      a. Within 2 in. of field welds or contact surfaces within friction type joints using high strength bolts.
      b. Encased in concrete.
   2. Apply shop coat before shipping.

C. Apply two coats to all surfaces which will be inaccessible after erection.
   1. Minimum coating dryfilm thickness:
      a. Single coat: 2.0 mils
      b. Double coat: 4.0 mils
   2. Paint shall be dry before handling or loading steelwork for shipment.

D. Field Touch-Up: After erection clean and paint as described in shop coat:
   1. All damaged areas of shop coat.
   2. Exposed surfaces of bolts.
   3. Bolt heads, nuts and washers.
   4. All field welds and unpainted areas adjacent to field welds.

3.04 FIELD QUALITY CONTROL

A. Field inspection will be performed under provisions of Section 01400.

END OF SECTION

SECTION 05210
STEEL JOISTS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Open web steel joists with bridging, attached seats, anchors and miscellaneous accessories.

B. Framed roof openings.

1.02 RELATED SECTIONS

A. Section 05120 - Structural Steel.

B. Section 05500 - Metal Fabrications.

C. Section 09900 - Painting.

1.03 REFERENCES

A. ASTM A108 - Steel Bars, Carbon, Cold-Finished, Standard Quality.

B. ASTM A153 - Zinc Coating (Hot Dip) on Iron and Steel Hardware.

C. ASTM A307 - Carbon Steel Threaded Standard Fasteners.

D. AWS D1.1 - Structural Welding Code.

E. FS TT-P-636 - Primer Coating, Alkyd, Wood and Ferrous Metal.

F. SJI - Standard Specifications for Open Web Steel Joists K and H Series.

G. SJI - Standard Specifications for Longspan Steel Joists LH and LJ Series and Deep Longspan Steel Joists DLH and DLJ Series.

H. SSPC - Steel Structures Painting Council.

1.04 SUBMITTALS

A. Submit under provisions of Section 01300.

B. Shop Drawings:
   1. Indicate standard designations, configuration, sizes, spacing, locations of joists, joist leg extensions.
   2. Joist coding, bridging, connections, attachments.
   3. Cambers.

1.05 QUALITY ASSURANCE

A. Perform Work in accordance with SJI Standard Specifications, Load Tables, and Weight Tables, including headers and other supplementary framing.

B. Maintain one copy of each document on site.

1.06 QUALIFICATIONS

A. Fabricator: Company specializing in performing the work of this Section with minimum 3 years documented experience.

B. Erector: Company specializing in performing the work of this Section with minimum 3 years documented experience.

C. Design connections not detailed on the Drawings under direct supervision of a Professional Structural Engineer experienced in design of this work and licensed at the place where the Project is located in the State.

1.07 DELIVERY, STORAGE, AND HANDLING

A. Deliver products to site under provisions of Section 01600 and to SJI requirements.

B. Store and protect products under provisions of Section 01600 and to SJI requirements.

C. Protect joists from distortion or damage.

1.08 FIELD MEASUREMENTS

A. Verify that field measurements are as shown on Drawings. Notify Architect and Structural Engineer of discrepancies immediately.

PART 2 PRODUCTS

2.01 MATERIALS

A. Open Web Joists Members: Per Structural Drawings.

B. Anchor Bolts, Nuts, and Washers: ASTM A307 galvanized to ASTM A153.

C. Primer: FS TT-P-636.

D. Structural Steel For Supplementary Framing and Joist Leg Extensions: ASTM A36.

E. Welding Materials: AWS D1.1; type required for materials being welded.

2.02 FABRICATION

A. Provide bottom and top chord extensions as indicated.

B. Frame special sized openings in joist chord framing as detailed.

2.03 FINISH

A. Shop prime joists.

B. Leave structural steel members unprimed.

2.04 SOURCE QUALITY CONTROL

A. Testing and analysis of components will be performed under provisions of Section 01400.

PART 3 EXECUTION

3.01 EXAMINATION

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

B. Beginning of installation means erector accepts existing conditions.

3.02 ERECTION

A. Erect and bear joists on supports.

B. Allow for erection loads. Provide sufficient temporary bracing to maintain framing safe, plumb, and in true alignment until completion of erection and installation of permanent bridging and bracing.

C. Coordinate placement of anchors in concrete construction for securing bearing plates.

D. After joist alignment and installation of framing, field weld joist seat to bearing plates.

E. Position and field weld joist chord extensions and wall attachments.

F. Frame roof openings with supplementary framing.

G. Do not permit erection of decking until joists are braced, bridged, and secured.

H. Do not field cut or alter structural members without approval of joist fabricator.

I. After erection, prime welds, abrasions, and surfaces not shop primed, except surfaces to be in contact with concrete.

3.03 ERECTION TOLERANCES

A. Maximum Variation From Plumb: 1/4 inch.

B. Maximum Offset From True Alignment: 1/4 inch.

3.04 FIELD QUALITY CONTROL

A. Field inspection will be performed under provisions of Section 01400.

END OF SECTION

SECTION 05310
STEEL DECK

PART 1 GENERAL

1.01 SUMMARY

A. This Section includes the following:
1. Steel roof deck.
2. Composite steel floor deck.

B. RELATED SECTIONS: The following Sections contain requirements that relate to this Section:

1. Section 01400 - Quality Testing.
2. Section 03300 - Cast-in-Place Concrete.
3. Section 05120 - Structural Steel.
4. Section 05500 - Metal Fabrications.

1.02 SUBMITTALS

A. Submit under provisions of Section 01300.

B. Product data for each type of deck, accessory, and product specified.

C. Shop drawings showing layout and types of deck panels, anchorage details, reinforcing channels, pans, deck openings, special jointing, accessories, and attachments to the other construction.

D. Product certificates signed by manufacturers of steel deck certifying that their products comply with specified requirements.

1.03 QUALITY ASSURANCE

A. Installer Qualifications: Engage an experienced install who has completed steel deck similar in material, design, and extent to that indicated for this project and with a record of successful in-service performance.

B. Welding Standards: Comply with applicable provisions of WABO/AWS D1.1 “Structural Welding Code—Steel” and AWS D1.3 “Structural Welding Code—Sheet Steel.”

1. Certify that each welder has satisfactorily passed WAS qualification tests for welding processes involved and, if pertinent, has undergone re-certification.
2. All field welders certified by jurisdiction as required.

1.04 DELIVERY, STORAGE, AND HANDLING

A. Protect steel deck from corrosion, deformation, and other damage during delivery, storage, and handling.

B. Stack steel deck on platforms or pallets and slope to provide drainage. Protect with a waterproof covering and ventilate to avoid condensation.

PART 2 – PRODUCTS

2.01 MANUFACTURERS

A. Available manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated in the Work include, but are not limited to, the following:
1. BHP
2. Verco Manufacturing Co.

2.02 METAL DECK

A. Steel Roof Deck: Fabricate panels without top-flange stiffening grooves conforming to SDI Publication NO. 28 “Specifications and Commentary for Steel Roof Deck” and the following:
1. Galvanized Steel Sheet: ASTM A 446, Grade A, G60 (ASTM A 446M, Grade A, Z 180) zinc coated according to ASTM A 525 (ASTM A 525M)
2. Deck Profile: Type NR, narrow rib.
3. Profile Depth: 1 ½ inches (38mm).
4. Design Uncoated-Steel Thickness: as indicated on Drawings.
5. Span Condition: Triple span or more.
6. Side Joints: Overlapped.

B. Steel Floor Deck: Fabricate panels without top-flange stiffening grooves conforming to SDI Publication NO. 28 “Specifications and Commentary for Steel Roof Deck” and the following:
7. Galvanized Steel Sheet: ASTM A 446, Grade A, G60 (ASTM A 446M, Grade A, Z 180) zinc coated according to ASTM A 525 (ASTM A 525M)
8. Deck Profile: Type NR, narrow rib.
9. Profile Depth: 1 ½ inches (38mm).
10. Design Uncoated-Steel Thickness: as indicated on Drawings.
11. Span Condition: Triple span or more.
12. Side Joints: Overlapped.

2.03 ACCESSORIES

A. General: Provide accessory materials for steel deck that comply with requirements indicated and recommendations of the steel deck manufacturer.

B. Mechanical Fasteners: Manufacturer’s standard, corrosion-resistant, low-velocity, powder-actuated or pneumatically driven carbon steel fasteners; or self-drilling, self-threading screws.

C. Rib Closure Strips: Manufacturer’s standard vulcanized, closed-cell, synthetic rubber.

D. Miscellaneous Roof Deck Accessories: Steel sheet, 0.0359-inch- (0.91-mm-) thick minimum ridge and valley plates, finish strips, and reinforcing channels, of same material as roof deck.

E. Pour Stops and Girder Fillers: Steel sheet, of same material as deck panels, and of thickness and profile indicated.

F. End Closures, Z-Closures, and Cover Plates: Steel sheet, of same material and thickness as deck panels, unless otherwise indicated.

G. Weld Washers: manufacturer's standard uncoated-steel sheet weld washers, shaped to fit deck rib, 0.0598 inch (1.5mm) thick with 3/8 inch (9.5mm) minimum diameter pre-punched hole.

H. Shear Connectors: ASTM A 108 Grade 1010 through 1020 headed stud type, cold-finished carbon steel, AWS D1.1, Type B.

I. Steel Sheet Accessories: ASTM A 446, G 60 (ASTM A 446M, Z 180) coating class, galvanized according to ASTM A 525 (ASTM A 525M).

J. Galvanizing Repair Paint: SSPC-Paint 20 or DOD-P-221035, with dry film containing a minimum of 94 percent zinc by dust weight.

PART 3 – EXECUTION

3.01 EXAMINATION

A. Examine supporting framing and field conditions for compliance with requirements for installation tolerances and other conditions affecting performance of steel deck.

3.02 PREPARATION

A. Locate decking bundles to prevent overloading of supporting members.

3.03 INSTALLATION, GENERAL

A Install deck panels and accessories according to applicable specifications and commentary of SDI Publication No. 28, manufacturer's recommendations, and requirements of the Sections.

B. Place deck panels on supporting framing and adjust to final position with ends accurately aligned and bearing on supporting framing before being permanently fastened. Do not stretch or contract side lap interlocks.

C. Place deck panels flat and square and fasten to supporting framing without warp or deflection.

D. Cut and neatly fit deck panels and accessories around opening and other work

projecting through or adjacent to the decking.

E. Provide additional reinforcement and closure pieces at openings as required for strength, continuity of decking, and support of other work.

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

3.04 METAL DECK INSTALLATION

A. Fasten metal deck panels to steel supporting members by arc spot (puddle) welds of the surface diameter indicated, Weld Washers: Install weld washers at each weld location.

B. Side Lap and Perimeter Edge Fastening: Fasten side laps and perimeter edges of panels between supports, at intervals not exceeding 36 inches, with 1 ½" long minimum welds. See Structural Drawings.

C. End Bearing: Install deck ends over supporting framing with a minimum end bearing of 1 ½ inches, with end joints as follows:
   1. End Joints: Lapped or butted at Contractor's option.

D. Shear Connectors: Weld shear connectors through deck to support framing according to AWS D1.1 and manufacturer's instructions. Butt end joints of deck panels; do not overlap. See Structural Drawings.

E. Pour Stops and Girder Fillers: Weld steel sheet pour stops and girder filler to supporting structure according to SDI recommendations, unless otherwise indicated. Provide tight-fitting closures at open ends of ribs and sides of decks.

3.05 FIELD QUALITY CONTROL

A. Testing Agency: A qualified independent testing agency employed and paid by Owner will perform field quality-control testing.

B. Field welds will be subject to inspection and tested agency will report test results promptly and in writing to Contractor and Architect.

C. Shear connector welds will be inspected and testing according to the requirements of AWS D1.1 for stud welding and as follows:
   1. Shear connector welds will be visually inspected.
   2. Bend tests will be performed when visual inspections reveal either less than a continuous 360 degree flash or welding repairs to any shear connector.
   3. Tests will be conducted on additional shear connectors when weld fracture occurs on shear connectors already tested, according to the requirements of AWS D1.1.

D. Remove and replace work that does not comply with spcified requirements.

E. Additional testing will be performed to determine compliance of corrected work with specified requirements, at Contractor's expense.

3.06 REPAIRS AND PROTECTION

A. Galvanizing Repairs: Prepare and repair damaged galvanized coatings on both surfaces with galvanized repair paint according to ASTM A 780 and the manufacturer's instructions.

END OF SECTION

SECTION 05400
COLD-FORMED METAL FRAMING

PART 1 GENERAL

1.01 SUMMARY

A. Section Includes:
1. Interior load-bearing wall framing.
2. Ceiling joist framing.
3. Gypsum sheathing and air-infiltration barriers.

B. Related Sections:
1. Section 01410 - Testing Laboratory Services.
2. Section 09110 - Non-load-bearing Metal Framing-for interior non-load-bearing metal stud assemblies.

C. Products installed but not furnished in this section:
1. Section 05500 - Metal Fabrications
2. Section 06112 - Framing and Sheathing.

1.02 REFERENCES

A. American Society for Testing and Materials (ASTM):
1. ASTM A653 - Steel Coding.
2. ASTM A570 - Hot-rolled Sheet Steel.
3. ASTM A611 - Cold-rolled Sheet Steel.
4. ASTM A792 - Aluminum-Zinc-Coated Sheet Steel.
5. ASTM C955 - Steel Studs.
6. ASTM A36 - Zinc-Coated Hot-Dip Steel.
7. ASTM C150 - Portland Cement Grout.

B. Specification for the Design of Cold-Formed Steel Structural Members:

1.03 SUBMITTALS

A. Section 01330 – Submittal Procedures

B. Product data for each type of cold-formed metal framing, accessory, and product specified, clearly indicating all dimensions, gauges, and proposed locations.

C. Shop Drawings: Show layout, spacings, sizes, thicknesses, and types of cold-formed metal framing; fabrication; and fastening and anchorage details, including mechanical fasteners.

D. Mill certificates signed by steel sheet producer indicating steel sheet complies with requirements.

E. Welding Certificates: Signed by contractor certifying that welders comply with requirements specified under the “Quality Assurance” article.

1.04 PERFORMANCE REQUIREMENTS

A. General: Design of steel-stud framing elements is the responsibility of the contractor. Framing studs, tracks, bracing, connections, furring, and related elements are shown on the drawings for dimensional purposes and to show assumptions used in the design of the primary building structure.
   1. Connections to the primary building structure are to be designed and detailed to prevent localized overstress, torsion overstress and deflection due to torsion of the primary building structure elements.

B. Structural Performance: Framing systems and connection are required to be capable of withstanding the following design loads within limits and under conditions indicated:
   1. Design Loads:
      a. Dead Loads.
      b. Snow Load.
      c. Wind and Seismic Loads.
   2. Deflection Limits:
      a. Vertifical Deflection: 1/600 of the span for brick veneer; 1/360 of the span for all other conditions.
      b. Horizontal Deflection: 1/360 of the wall height, and/or opening width.
   3. Sideway (Story Drift):
      a. Provide steel stud framing, including anchorage, capable of withstanding the maximum story drift of the Code.
   4. Design Framing System:
      a. To maintain clearances at openings, to allow for construction tolerance and to accommodate live load deflection of primary building structure as follows:
         i. Floor Deflections: Upward and downward movement of span/360.
         ii. Roof Deflections: Upward and downward movement of span/240.
      b. To accommodate horizontal deflection without regard for contribution of sheathing materials, or brick veneer.

C. Physical and Structural Properties: C-studs with minimum yield of 33,000 PSI (18 and 20 gage), and 50,000 PSI (12, 14, and16 gage). Structural performance and spacings as required by shop drawing design/build documents.

1.05 QUALITY ASSURANCE

A. Installer Qualifications: Engage an experienced installer who has completed cold-formed metal framing similar in material, design, and extent to that indicated for this project and with a record of successful in-service performance.

B. Testing Agency Qualifications: An independent testing agency, acceptable to authorities having jurisdiction.

C. Welding: Qualify procedures and personnel according to AWS D1.1, “Structural Welding Code--Steel”, and AWS D1.3, “Structural Welding Code--Sheet Steel”.

D. Fire-Test-Response Characteristics: Where fire-resistance-rated assemblies are indicated, provide cold-formed metal framing identical to that tested as part of an assembly for fire resistance per ASTM E 119 by an independent testing and inspecting agency acceptable to authorities having jurisdiction.

E. AISI Specifications: Comply with AISI’s “Specification for the Design of Cold-Formed Steel Structural Members”.

F. Engineering Responsibility: Engage a qualified professional engineer to prepare design calculations, shop drawings and other structural data.

1.06 DELIVERY, STORAGE AND HANDLING

A. Protect cold-formed metal framing from corrosion, deformation, and other damage during delivery, storage, and handling.

B. Store cold-formed metal framing, protect with a waterproof covering, and ventilate to avoid condensation.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. Manufacturers: Subject to compliance with requirements, provide cold-formed metal framing by one of the following:
1. Dietrich Industries, Inc.
2. Scafco Corp.
3. Steeler, Inc.
4. Or Approved Equal

2.02 MATERIALS

A. Steel Sheet: ASTM A653/A653M, structural steel, zinc coated.

B. Steel Sheet: ASTM A570/A570M, hot rolled or ASTM A611, cold rolled; cleaned, pretreated, and primed with manufacturer’s baked-on, lead- and chromate-free, rust-inhibitive primer complying with performance requirements.

C. Steel Sheet: ASTM A792/A792M, structural steel, 55 percent aluminum-zinc-alloy coated.

2.03 LOAD-BEARING WALL FRAMING

A. Steel Studs: Manufacturer’s standard C-shaped steel studs, of web depths indicated, punched, with stiffened flanges, complying with ASTM C955.

B. Steel Track: Manufacturer's standard U-shaped steel track, of web depths indicated, unpunched, with straight flanges, oversized to allow full bearing of studs, complying with ASTM C955.

2.04 NON-LOAD-BEARING CURTAIN-WALL FRAMING

A. Steel Studs: Manufactuer’s standard C-shaped steel studs, of web depths indicated, punched, with stiffened flanges, complying with ASTM C955.

B. Steel Track: Manufacturer's standard U-shaped steel track, of web depths indicated, unpunched, with unstiffened flanges, complying with ASTM C955.

C. Single Deflection Track: Manufacturer’s single, deep-leg, U-shaped steel track; unpunched, with unstiffened flanges, of web depth to contain studs while allowing free vertical movement, with flanges designed to support horizontal and lateral loads.

D. Double Deflection Tracks: Manufacturer’s double, deep-leg, U-shaped steel tracks, consisting of nested inner and outer tracks; unpunched, with unstiffened flanges.

E. Vertical Deflection Clips: Manufacturer’s standard clips, capable of accommodating upward and downward vertical displacement of primary structure.

2.05 FRAMING ACCESSORIES

A. Fabricate steel-framing accessories of the same material and finish used for framing members with a minimum yield strength of 33,000 psi.

B. Provide accessories of manufacturer’s standard thickness and configuration, unless otherwise indicated.

2.06 ANCHORS, CLIPS AND FASTENERS

A. Steel Shapes and Clips: ASTM A36/A36M, zinc coated by hot-dip process according to ASTM A123.

B. Anchor Bolts: ASTM F1554, Grade, threaded carbon-steel bolts and carbon-steel nuts; and flat, hardened-steel washers.

C. Power-Actuated Anchors: Fastener system of type suitable for application indicated.

D. Mechanical Fasteners: Corrosion-resistant-coated, self-drilling, self-threading steel drill screws.

E. Welding Electrodes: Comply with AWS standards.

2.07 MISCELLANEOUS MATERIALS

A. Galvanizing Repair Paint.

B. Cement Grout: Portland cement, ASTM C150, Type I; and clean, natural sand.

C. Nonmetallic, Nonshrink Grout: Premixed, nonmetallic, noncorrosive, nonstaining grout contained selected silica sands, portland cement, shrinkage-compensating agents, and plasticizing and water-reducing agents.

2.8 FABRICATION

A. Fabricate cold-formed metal framing and accessories plumb, square, true to line, and with connections securely fastened, according to manufacturer's recommendations and requirements.

B. Reinforce, stiffen, and brace framing assemblies to withstand handling, delivery, and erections stresses.

C. Fabrication Tolerances: Fabricate assemblies level, plumb, and true to line to a maximum allowable tolerance variation of 1/8 inch in 10 feet.

PART 3 EXECUTION

3.01 EXAMINATION

A. Examine supporting substrates and abutting structural framing for compliance with requirements for tolerances and other conditions affecting performance.

3.02 PREPARATION

A. Grout bearing surfaces uniform and level to ensure full contact of bearing flanges or track webs on supporting concrete or masonry construction.

3.04 INSTALLATION, GENERAL

A. Cold-formed metal framing may be shop or field fabricated for installation, or it may be field assembled.

B. Install cold-formed metal framing according to ASTM C1007, unless more stringent requirements are indicated.

C. Install shop- or field-fabricated, cold-formed framing and securely anchor to supporting structure.

D. Install cold-formed metal framing and accessories plumb, square, and true to line, and with connections securely fastened, according to manufacturer’s written recommendations and requirements.

E. Install framing members in one-piece lengths, unless splice connections are indicated for track or tension members.

F. Install temporary bracing and supports to secure framing and support loads comparable in intensity to those for which structure was designed.

G. Do not bridge building expansion and control joints with cold-formed metal framing. Independently frame both sides of joints.

H. Install insulation in built-up exterior framing members, such as headers, sills, boxed joists, and multiple studs at openings, that are inaccessible on completion of framing work.

3.05 NONLOAD-BEARING PARTITION INSTALLATION

A. Install continuous tracks sized to match studs. Align tracks accurately and securely anchor to supporting structure as indicated.

B. Squarely seat studs against webs of top and bottom tracks. Fasten both flanges of studs to top and bottom track, unless otherwise indicated. Space studs as noted on plans.

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

D. Where gypsum wallboard is omitted from one or both sides of partitions, install horizontal bridging, spaced in rows not more than 30 inches (762 mm) apart. Fasten at each stud intersection.

3.06 JOIST INSTALLATION

A. Install perimeter joist track sized to match joists.

B. Install joists bearing on supporting frame, level, straight, and plumb; adjust to final position, brace, and reinforce.

C. Space joists not more than 2 inches from abutting walls.

D. Frame openings with built-up joist headers consisting of joist and joist track, nesting joists, or another combination of connected joists if indicated.

E. Install joist reinforcement at interior supports with single, short length of joist section located directly over interior support, with lapped joists of equal length to joist reinforcement, or as indicated.

F. Install bridging at each end of joists and at intervals indicated.

G. Secure joists to load-bearing interior walls to prevent lateral movement of bottom flange.

H. Install miscellaneous joist framing and connections, including web stiffeners, closure pieces, clip angles, continuous angles, hold-down angles, anchors, and fasteners, to provide a complete and stable joist-framing assembly.

3.07 FIELD QUALITY CONTROL

A. Remove and replace work that does not comply with specified requirements.

B. Additional testing and inspecting, at contractor’s expense, will be performed to determine compliance of corrected work with specified requirements.

3.08 REPAIRS AND PROTECTION

E. Galvanizing Repairs: Prepare and repair damaged galvanized coatings on fabricated and installed cold-formed metal framing with galvanized repair paint according to ASTM A780 and the manufacturer's instructions.

F. Touchup Painting: Wire brush, clean, and paint scarred areas, welds, and rust spots on fabricated and installed prime-painted, cold-formed metal framing.

C. Protect paper-surfaced gypsum sheathing that will be exposed to weather for more than 30 days by covering exposed exterior surface of sheathing with a securely fastened air-infiltration barrier.

D. Protect cutouts, corners, and joints in sheathing by filling with a flexible sealant or by applying tape recommended by sheathing manufacturer at time sheathing is applied.

E. Provide final protection and maintain conditions in a manner acceptable to manufacturer and installer.

END OF SECTION

SECTION 05500
METAL FABRICATIONS

PART 1 GENERAL

1.01 SUMMARY

A. Section Includes:
1. Shop fabricated ferrous metal items, galvanized and prime painted as required and as scheduled, including
A. Steel Stairs
B. Guard Railing
C. Hand Railing
D. Bollards
E. Miscellaneous steel items

B. Related Sections:
1. Section 01400 - Quality Control.
2. Section 01410 - Testing Laboratory Services.
3. Section 05120 - Structural Steel.
4. Section 09900 - Painting: Paint finish.

C. Products Furnished But Not Installed Under this Section:
1. Section 03300 - Cast-In-Place Concrete: Placement of metal fabrications in concrete.

1.02 REFERENCES

A. American Society for Testing and Materials (ASTM):
1. ASTM A572 - Structural Steel.
2. ASTM A53 - Hot-Dipped, Zinc-coated Welded and Seamless Steel Pipe.
3. ASTM A307 - Carbon Steel Externally Threaded Standard Fasteners.
4. ASTM A325 - High Strength Bolts for Structural Steel Joints.
5. ASTM A386 - Zinc-Coating (Hot-Dip) on Assembled Steel Products.
6. ASTM A500 - Cold-Formed Welded and Seamless Carbon Steel Structural Tubing in Round and Shapes.

B. American Welding Society (AWS):
1. AWS A2.0 - Standard Welding Symbols.
2. AWS D1.1 - Structural Welding Code.

C. Steel Structures Painting Council (SSPC):
1. SSPC Painting Manual, Volume II, Systems and Specifications.

1.03 SUBMITTALS

A. Submit under provisions of Section 01300.

B. Product Data:
1. Submit manufacturers specifications and installation instructions for all

prefabricated items.

C. Shop Drawings:
   1. Indicate profiles, sizes, connection attachments, reinforcing, anchorage, size and type of fasteners, and accessories.
   2. Include erection drawings, elevations, and details where applicable.
   3. Indicate welded connections using standard AWS A2.0 welding symbols. Indicate net weld lengths.
   4. Provide structural calculations, stamped by a Registered Professional Engineer in the State of Oregon, for the design of steel stairs and supporting elements (including columns and footings), guard railing, hand railing and all attachments and supports.

1.04 FIELD MEASUREMENTS

A. Verify that field measurements are as indicated on Drawings.

PART 2 PRODUCTS

2.01 MATERIALS

A. Steel Sections: ASTM A572.

B. Steel Tubing: ASTM A500, Grade B.

C. Plates: ASTM A36.

D. Pipe: ASTM A53, Grade B, Schedule 40, unless otherwise noted.

E. Welding Materials: AWS D1.1; type required for materials being welded.

F. Shop and Touch-Up Primer: SSPC 15, Type 1, red oxide.

G. Touch-Up Primer for Galvanized Surfaces: Zinc rich type.

H. Non-Metallic, Non-Shrink Grout: Corps of Engineers CRD-C588, Non-Metallic Grout and Burke Conc. Accessories, Inc., Sealtight 588 by W.R. Meadows, Inc., Masterflow by Master Builders, Sonogrout by Sonneborn, Thoroset by Thoro System Products, Five Star Grout by U.S. Grout Corp., Upcon by Bostik, or equal.

2.02 FABRICATION

A. Verify dimensions on jobsite prior to shop fabrication.

B. Fit and shop assemble in largest practical sections, for delivery to Site.

C. Fabricate items with joints tightly fitted and secured.

D. Continuously seal joined members by continuous welds.

E. Grind exposed joints flush and smooth with adjacent finish surface. Make exposed joints butt tight, flush, and hairline. Ease exposed edges to small uniform radius.

F. Exposed Mechanical Fastenings: Flush countersunk screws or bolts; unobtrusively located; consistent with design of component, except where specifically noted otherwise.

G. Supply components required for anchorage of fabrications. Fabricate anchors and related components of same material and finish as fabrication, except where specifically noted otherwise.

2.03 FINISHES

A. Clean surfaces of rust, scale, grease, and foreign matter prior to finishing.

B. Do not prime surfaces in direct contact with concrete or where field welding is required.

C. Shop prime all exposed and concealed interior steel members.

D. Shop galvanize all exposed exterior steel, after fabrication to a minimum 2.0 oz/sq. ft zinc coating in accordance with ASTM A386.

PART 3 EXECUTION

3.01 EXAMINATION

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

B. Beginning of installation means erector accepts existing conditions.

3.02 PREPARATION

A. Clean and strip primed steel items to bare metal where site welding is required.

B. Supply items required to be cast into concrete or embedded in masonry with setting templates, to appropriate sections.

3.03 INSTALLATION

A. Install items plumb and level, accurately fitted, free from distortion or defects.

B. Allow for erection loads, and for sufficient temporary bracing to maintain true alignment until completion of erection and installation of permanent attachments.

C. Perform field welding in accordance with AWS D1.1.

D. Obtain Architect/Engineer approval prior to site cutting or making adjustments not scheduled.

E. After erection prime welds, abrasions, and surfaces not shop primed galvanized, except

for surfaces to be in contact with concrete.

3.04 ERECTION TOLERANCES

A. Maximum Variation From Plumb: 1/4 inch in 10 feet, non-cumulative.

B. Maximum Offset From True Alignment: 1/4 inch.

3.05 SCHEDULE

A. The following schedule is list of principal items only. Refer to Drawing details for items not specifically scheduled.

B. Connection: Fabricate of welded construction, drill and tap as required to receive hardware and similar items. Include required anchors for building into other work.

C. Structural Connectors: Furnish custom fabricated bolts, plates, tie rods, anchors, dowels, and other steel shapes for framing, supporting, and anchoring framing.

D. Loose Bearing Plates: Provide for steel items bearing on masonry or concrete as indicated. Drill plates to receive anchor bolts.

E. Roof Access Ladder: Steel, of 3/8 x 2 side rails spaced at 20 inches; rungs of one inch diameter solid rod spaced 12 inches on center; space rungs 7 inches from wall surface; with steel mounting brackets and attachments; galvanized finish.

END OF SECTION

SECTION 05515
LADDERS

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Aluminum cage ladders.

1.2 RELATED SECTIONS

A. Section 05500 – Metal Fabrications: Fasteners and installation requirements used to attach ladders to structure.

1.3 REFERENCES

A. AA – Aluminum Association.

B. ASTM B 209 - Standard Specification for Aluminum and Aluminum-Alloy Sheet and Plate.

C. ASTM B 221 - Standard Specification for Aluminum and Aluminum-Alloy Extruded Bars, Rods, Wire, Profiles, and Tubes.

D. OSHA 1910.27 – Fixed Ladders.

1.4 SUBMITTALS

A. Submit under provisions of Section 01300.

B. Product Data: Manufacturer's data sheets on each product.

C. Shop Drawings:
   1. Detail fabrication and erection of each ladder indicated. Include plans, elevations, sections, and details of metal fabrications and their connections.
   2. Provide templates for anchors and bolts specified for installation under other Sections.
   3. Provide reaction loads for each hanger and bracket.

D. Qualification Data:
   1. Refer to Quality Assurance provisions for submittal requirements evidencing experience, certifications and resources.

E. Selection Samples: For each finish specified, two complete sets of color chips representing manufacturer's full range of available colors.

F. Verification Samples: For each finish specified, two samples, minimum size 6 inches (150 mm) square, represent actual product color.

1.5 QUALITY ASSURANCE

A. Manufacturer Qualifications: A firm experienced in producing aluminum metal ladders similar to those indicated for this Project.
   1. Record of successful in-service performance.

2. Sufficient production capacity to produce required units.
3. Professional engineering competent in design and structural analysis to fabricate ladders in compliance with industry standards and local codes.

B. Installer Qualifications: Competent and experienced firm capable of selecting fasteners and installing ladders to attain designed operational and structural performance.

C. Product Qualification: Product design shall comply with OSHA 1910.27 minimum standards for ladders.

D. Mock-Up: Provide a mock-up for evaluation of surface preparation techniques and application workmanship.
1. Install ladder in area designated by Architect.
2. Do not proceed with remaining work until workmanship and installation are approved by Architect.
3. Rework mock-up as required to produce acceptable work.

1.6 DELIVERY, STORAGE, AND HANDLING

A. Store products in manufacturer's unopened packaging until ready for installation.

1.7 PROJECT CONDITIONS

A. Field Measurements: Verify dimensions by field measurement before fabrication.
1. Established Dimensions: Where field measurements cannot be made without delaying the Work, indicate established dimensions on shop drawing submittal and proceed with fabrication.

1.8 WARRANTY

A. Manufacturer has responsibility for an extended Corrective Period for work of this Section for a period of 5 years from date of Substantial Completion against all the conditions indicated below, and when notified in writing from Owner, manufacturer shall promptly and without inconvenience and cost to Owner correct said deficiencies.
1. Defects in materials and workmanship.
2. Deterioration of material and surface performance below minimum OSHA standards as certified by independent third party testing laboratory. Ordinary wear and tear, unusual abuse or neglect excepted.
3. Within the warranty period, the manufacturer shall, at its option, repair, replace, or refund the purchase price of defective ladder.

B. Manufacturer shall be notified immediately of defective products, and be given a reasonable opportunity to inspect the goods prior to return. Manufacturer will not assume responsibility, or compensation, for unauthorized repairs or labor. Manufacturer makes no other warranty, expressed or implied, to the merchantability, fitness for a particular purpose, design, sale, installation, or use, of the ladder; and shall not be liable for incidental or consequential damages, losses of or expenses, resulting from the use of ladder products.

1.9 EXTRA MATERIALS

A. Furnish touchup kit for each type and color of paint finish provided.

PART 2 PRODUCTS

2.1 MANUFACTURERS

A. Acceptable Manufacturer: O'Keeffe's, Inc.; 325 Newhall St. San Francisco, CA 94124. ASD. Toll Free Tel: (888) 653-3333. Tel: (415) 824-4900. Fax: (415) 824-5900. Email: info@okeeffes.com. Web: http://www.okeeffes.com.

B. Substitutions: Not permitted.

C. Requests for substitutions will be considered in accordance with provisions of Section 01600.

2.2 APPLICATIONS/SCOPE

A. Cage Ladder:
    1. Cage Ladder with Roofover Rail Extension.
        a. Model 532 as manufactured by O'Keeffe's Inc.

2.3 FINISHES

A. Mill finish. As extruded.

B. Clear Anodic Finish: AA-M10C22A41 Mechanical finish as fabricated. Architectural Class I, clear coating 0.018 mm or thicker.

C. Paint. Urethane over chemically pretreated substrate.
    1. As scheduled on drawings.

2.4 MATERIALS

A. Aluminum Sheet: Alloy 5005-H34 to comply with ASTM B209.

B. Aluminum Extrusions: Alloy 6063-T6 to comply with ASTM B221.

2.5 FABRICATION

A. Rungs: Not less than 1-1/4 inches (32 mm) in section and 18–3/8 inches (467mm) long, formed from tubular aluminum extrusions. Squared and deeply serrated on all sides.
    1. Rungs shall withstand a 1,500 pound (454 kg) load without deformation or failure.

B. Channel Side Rails: Not less than 1/8 inch (3 mm) wall thickness by 3 inches (76 mm) wide.

C. Heavy Duty Tubular Side Rails: Assembled from two interlocking aluminum extrusions no less than 1/8 inch (3 mm) wall thickness by 3 inches (76 mm) wide. Construction shall be self-locking stainless steel fasteners, full penetration TIG welds and clean, smooth and burr-free surfaces.

D. Walk-Through Rail and Roof Rail Extension: Not less than 3 feet 6 inches (1067 mm) above the landing and shall be fitted with deeply serrated, square, tubular grab rails.

E. Landing Platform: 1-1/2 inches (38 mm) or greater diameter, tubular aluminum guardrails and decks of serrated aluminum treads.

F. Security Doors: Formed 1/8 inch (3 mm) thick aluminum sheet. Security panels shall extend on both sides, perpendicular to the door face, to within 2 inches (51 mm) of the wall. Security door shall be furnished with continuous aluminum piano hinge and heavy duty forged steel locking hasps.

G. Ladder Safety Post: Retractable hand hold and tie off.

H. Safety Cages:
   1. Fabricate ladder safety cages to comply with authority having jurisdiction. Assemble by welding. Spacing of primary hoops, secondary hoops and vertical bars shall not exceed that required by code.
   2. Safety cage hoops and vertical bars: 3/16 inch (5 mm) by 2 inches (51 mm) aluminum bar.

PART 3 EXECUTION

3.1 EXAMINATION

A. Coordinate anchorages. Furnish setting drawings, templates, and anchorage structural loads for fastener resistance.

B. Do not begin installation until supporting structure is complete and ladder installation will not interfere with supporting structure work.

C. If supporting structure is the responsibility of another installer, notify Architect of unsatisfactory supporting work before proceeding.

3.2 INSTALLATION

A. Install in accordance with manufacturer's instructions and in proper relationship with adjacent construction.

3.3 PROTECTION

A. Protect installed products until completion of project.

B. Touch-up, repair or replace damaged products before Substantial Completion.

END OF SECTION

SECTION 06112
FRAMING AND SHEATHING

PART 1 GENERAL

1.01 SUMMARY

A. Section Includes:
1. Wall and roof sheathing.
2. Miscellaneous framing and sheathing.
3. Telephone and electrical panel boards.
4. Concealed wood blocking for support of toilet and bath accessories and fire stopping.

B. Related Sections:
1. Section 07210 - Building Insulation.
2. Section 09110 - Non-Load Bearing Metal Framing.
3. Section 09250 - Gypsum Board: Gypsum Sheathing.
4. Section 10800 - Toilet and Bath Accessories.

C. Products Furnished but Not Installed Under This Section:
1. Section 05500 - Metal Fabrications: Placement of steel fabrications embedded or bearing upon and anchored into concrete and masonry.

1.02 REFERENCES

A. American Lumber Standards Committee (ALSC):
1. ALSC softwood Lumber Standards.

B. American National Standards Institute (ANSI):
1. ANSI A208.1 - Mat-Formed Wood Particleboard.
2. ANSI/AHA A135.4 - Basic Hardboard.

C. American Plywood Association (APA).

D. American Wood Preservers Association (AWPA):
1. AWPA C1 - All Timber Products Preservative Treatment by Pressure Process.
2. AWPA C20 - Structural Lumber Fire Retardant Treatment by Pressure Process.

E. National Forest Products Association (NFPA).

F. West Coast Lumber Inspection Bureau (WCLIB).
1. WCLIB...Grading and Dressing Rules No. 16.

G. Western Wood Products Association (WWPA).
1. WWPA...Grading Western Lumber.

1.03 QUALITY ASSURANCE

A. Perform Work in accordance with following agencies:

1. Lumber Grading Agency: Certified by ALSC.
2. Plywood Grading Agency: Certified by APA.

1.04 DELIVERY, STORAGE, AND HANDLING

A. Deliver products to Site, store, protect, and handle under provisions of Section 01600.

PART 2 PRODUCTS

2.01 MATERIALS

A. Provide structural wood materials with grade stamps of WCLIB or WWPA, and as modified herein.
1. All lumber shall be free of noticeable warp or twist, with less than 5% showing "very light" warp, twist, bow, cup or crook per Rule 16.
2. Seal end grain of material prior to delivery to Project Site.

B. Provide material with maximum moisture content 19% for all joists, studs, blocking, ledgers and beams. Contractor's option: air dried or KD.

C. Provide all blocking, sill plates, and nailers in contact with concrete, at or near grade or exposed to weather: Coast region Douglas Fir, Construction or No. 2, KD, WCLIB, S4S, pressure treated per Fed. Spec. TT-W-571.

D. Light Framing Lumber: Douglas Fir-Larch, S4S, No. 2 and better.

E. Structural Joists: Douglas Fir-Larch, No. 2 and better, S4S, except as noted otherwise on Drawings.

F. Beams: Douglas Fir-Larch, No. 1, S4S, except as noted otherwise on Drawings.

G. Studs: Douglas Fir-Larch, No. 2 and better.

H. Softwood Plywood: APA Rated Sheathing Structural II or CDX exterior with exterior glue.
1. Sheathing: ¼" CDX; P.I. 48/24, T & G on long side,) ¾" CDX; P.I. 24/0 5 ply ½" CDX; P.I. 24/0.
2. No OSB board will be allowed.

H. Gypsum Sheathing: Refer to Section 09250.

2.02 ACCESSORIES

A. Fasteners and Anchors:
1. Fasteners: Zinc electroplated steel for high humidity at treated wood locations; use stainless steel only; unfinished steel elsewhere.
2. Drywall Screws: Bugle head, hardened steel, power driven type, length three times thickness of sheathing.
3. Anchors: ASTM A307; Expansion shield and lag bolt type for anchorage to solid

masonry or concrete. Bolt or ballistic fastener for anchorages to steel.

B. Die Stamped Connectors: Hot dipped galvanized steel.

C. Joist Hangers: Hot dipped galvanized steel, sized to suit framing conditions, except at treated wood use stainless steel, Simpson, or approved substitute.

PART 3 EXECUTION

3.01 FRAMING

A. Set structural members level and plumb, in correct position.

B. Make provisions for erection loads, and for sufficient temporary bracing to maintain structure safe, plumb, and in true alignment until completion of erection and installation of permanent bracing.

C. Place horizontal members flat, crown side up.

D. Construct load bearing framing and curb members full length without splices.

E. Double members at openings over 24 inches wide. Space short studs over and under opening to stud spacing.

F. Construct double joist headers at floor and ceiling openings and under wall stud partitions that are parallel to floor joists. Frame rigidly into joists.

G. Bridge joists in excess of 8 feet span at mid-span. Fit solid blocking at ends of members.

H. Place sill gasket directly on cementitious foundation. Puncture gasket clean and fit tight to protruding foundation anchor bolts.

I. Coordinate installation of wood chord metal joists, glue laminated structural units, prefabricated wood trusses, and plywood web joists.

J. Curb roof openings except where prefabricated curbs are provided. Form corners by alternating lapping side members.

K. Coordinate curb installation with installation of decking and support of deck openings.

3.02 SHEATHING

A. Secure roof sheathing perpendicular to framing members with ends staggered and sheet ends over firm bearing.

B. Secure wall sheathing with long dimension parallel to wall studs, with ends over firm bearing.

C. Place building paper horizontally over wall sheathing, weather lap edges and ends.

D. Install plywood to multiple span feasible.

E. Install telephone and electrical panel boards with plywood sheathing material where required. Over size the panel by 12 inches on all sides.

3.03 TOLERANCES

A. Framing Members: 1/4 inch from true position, maximum treatment.

END OF SECTION

SECTION 06180
GLUE LAMINATED STRUCTURAL UNITS

PART 1 GENERAL

1.01 SUMMARY

A. Section Includes:
1. Glue laminated wood beams.
2. Steel hardware and attachment brackets.

B. Related Work:
1. Section 05120 - Structural Steel: Prefabricated steel structural supports.
2. Section 06112 - Framing and Sheathing: Roof sheathing.
3. Section 06193 - Fabricated Wood Trusses

1.02 REFERENCES

A. American Institute of Timber Construction (AITC).

B. American Lumber Standards Committee (ALSC):
1. ALSC Softwood Lumber Standards.

C. American National Standards Institute (ANSI):
1. ANSI A190.1 - Structural Glued Laminated Timber.

D. American Society for Testing and Materials (ASTM):
1. ASTM A36 - Structural Steel.
2. ASTM A123 - Zinc (Hot Galvanized) coatings on Products Fabricated from Rolled, Pressed, and Forged Steel Shapes, Plates, Bars, and Strip.
3. ASTM D2559 - Adhesives for Structural Laminated Wood Products for Use Under Exterior (Wet Use) Exposure Conditions.

E. American Wood Preservers' Association (AWPA).

1.03 SUBMITTALS

A. Submit under provisions of Section 01300.

B. Shop Drawings:
1. Indicate framing system, sizes and spacing of members, loads and cambers, bearing and anchor details, bridging and bracing and framed openings.

C. Furnish to Architect AITC "Certificate of Performance" with any attachments executed.

1.04 QUALITY ASSURANCE

A. Manufacturer Qualifications: Company specializing in manufacture of glue laminated structural units with three years minimum experience, and certified by AITC.

B. Erector Qualifications: Company specializing in erection of glue laminated structural

units with three years documented experience, and approved by manufacturer.

C. Regulatory Requirements:
   1. Conform to applicable code for loads, seismic zoning, and other load criteria.

D. Each member to be stamped with the AITC quality inspected stamp.

1.05 DELIVERY, STORAGE, AND HANDLING

A. Deliver products to Site, store and protect under provisions of Section 01600.

B. Protect members in accordance with AITC requirements for load wrapped material.

PART 2 PRODUCTS

2.01 MATERIALS:

A. Lumber: Douglas Fir - Larch Industrial Grade lumber. Design for following values:
   1. See Structural General notes.
   2. F.R.P. Glu Lams are not allowed.

B. Accessories:
   1. Steel Connections and Brackets: ASTM A36; weldable quality, prime painted SSPC Paint 15, Type I, red oxide.
   2. Hardware: ASTM A307, structural quality steel.
   3. Adhesive: ASTM D2559 for wet condition of service.

2.02 FABRICATION:

A. Verify dimensions and site conditions prior to fabrication.

B. Fabricate glue laminated structural members in accordance with Contract Documents, reviewed Shop Drawings, and AITC industrial grade.

   1. Cut and fit members accurately to length to achieve tight joint fit.
   2. Fabricate member with camber built in. Where camber is not noted, provide standard 2,000 foot radius camber for simple span conditions.
   3. Do not splice or join members in locations other than that indicated, without permission.

C. Fabricate steel hardware and connections with joints neatly fitted, welded, and ground smooth.

PART 3 EXECUTION

3.01 EXAMINATION:

A. Verify that supports are ready to receive work.

B. Verify sufficient end bearing area.

C. Beginning of installation means acceptance of existing conditions.

3.02 PREPARATION

A. Coordinate placement of support items.

3.03 ERECTION

A. Set structural members level and plumb, in correct positions.

B. Provide temporary bracing and anchorage to hold members in place until permanently secured.

C. Fit members together accurately without trimming, cutting, or any other unauthorized modification.

3.04 TOLERANCES

A. Framing Members: 1/2 inch maximum from true position.

END OF SECTION

SECTION 06193
FABRICATED WOOD TRUSSES

PART 1 GENERAL

1.01 SUMMARY

A. Section Includes:
1. Prefabricated wood trusses for roof framing.
2. Bridging, Bracing, and anchorage.

B. Related Sections:
1. Section 06112 - Framing and Sheathing: Roof sheathing.

1.02 REFERENCES

A. NFPA - National Forest Products Association.

B. TPI - Truss Plate Institute.

C. WWPA - Western Wood Products Association.

1.03 QUALITY ASSURANCE

A. Any attachments or materials requirements for the performance of the trusses not shown on the Drawings is the responsibility of the truss manufacturer.

B. Manufacturer: Company specializing in manufacture of prefabricated wood trusses with three years minimum experience.

C. Design trusses under direct supervision of professional engineer experienced in structural framing design of trusses registered in the jurisdiction.

D. Lumber Grading Agency: Certified by BCLIB.

E. Truss Plates: In accordance with Truss Plate Institute.

1.04 REGULATORY REQUIREMENTS

A. Conform to applicable Code for loads, seismic zoning, and other governing load criteria

1.05 SUBMITTALS

A. Submittals are to be stamped and signed by a structural engineer registered in the state in which the project is located. Provide ICBO approval report or ICBO approved catalog for all items to be furnished. Products lacking such approval will not be accepted, unless accompanied by full design information and certification by a registered structural engineer that they are appropriate for the conditions of this project.

B. Indicate framing system, sizes and pacing of joints, loads and joist cambers, bearing and anchor details bridging and bracing, framed openings, and design calculations.

C. Submit along with shop drawings certification by an officer of the fabricating firm, indicating trusses comply with all project requirements, and that product will sustain all required design loading.

D. Engineering design considerations are fabricator's responsibility.

E. Shop drawings shall be reviewed by the Architect prior to fabrication. Do not fabricate and/or deliver any materials to jobsite until receipt of shop drawings acceptance by Architect.

1.06 DELIVERY, STORAGE, AND HANDLING

A. Deliver products to site.

B. Transport and store trusses in vertical position resting on bearing ends.

C. Protect trusses from moisture, warpage, and distortion during transit and when stored as recommended by the truss manufacturer.

PART 2 PRODUCTS

2.01 DESIGN REQUIREMENTS

A. Total Vertical Snow Load: 25 psf, minimum.

B. Apply wind and seismic loads as indicated on the structural drawings.

C. Apply perpendicular Wind Load 95 MPH Exposure 'B'

D. Total Combined Live and Deal Load Deflection: L/240 of span.

E. Total Live Load Deflection: L/360 of span.

2.02 MATERIALS

A. Lumber grading Rules: Douglas Fir S4S.

B. Steel Connectors: ASTM A 446 steel, Grade A, G60 galvanized, not less than 0.036 inch thickness. Metal plates must be tested and approved for 1 hour ceiling rated truss gypsum wall board assembly.

C. Fasteners: Size and type to suit condition.

2.03 FABRICATION

A. Verify dimensions and site conditions prior to fabrication

B. Cut members accurately to length to achieve tight joint connections.

C. Jig trusses during fabrication to assure accurate configuration.

D. Build camber into truss.

E. Fabricate and install trusses with bottom chord level and true within 1/8 inch per 12 feet.

F. Connector locations: Within ¼ inch of approved shop drawing location.

PART 3 EXECUTION

3.01 INSPECTION

A. Check all lines and levels, verify that supports and openings are ready to receive trusses.

B. Verify sufficient end bearing area.

C. Beginning of installation means acceptance of existing conditions.

3.02 INSTALLATION

A. The trusses if stored prior to erection shall be stored in a vertical position and protected from the weather, and be handled with care to avoid any damage. Trusses not so protected or damaged may be rejected by Architect.

B. Install trusses in accordance with manufacturer's instructions, at a spacing of 24 inches oc.

C. Place trusses true to line and level.

D. This contractor will be held responsible for correctness of framing and all expenses incurred by alteration due to error in laying out.

E. Provide temporary bracing to hold trusses in place until permanently secured.

F. Place permanent bridging, bracing, and anchors to maintain trusses straight and in correct position before inducing loads.

G. Do not field cut trusses.

H. Design, provide and maintain all necessary temporary rigging, shoring and bracing, in place, until such time as members are permanently anchored to structure.

I. Temporary construction loads greater than design limits are not permitted.

J. Erection bracing in addition to required bridging is to be provided as required to keep trusses straight and plumb as required and to assure lateral support for the individual trusses and entire system until the sheathing material has been applied.

K. Workmen are not to be on trusses until they are braced per truss manufacturer's recommendations or the plywood sheathing is installed.

L. Place headers and supports to frame openings required.

M. Coordinate placement of sheathing with work of this Section.

3.03 TOLERANCES

A. Framing Members: ½ inch maximum from true position.

END OF SECTION

SECTION 06200
FINISH CARPENTRY

PART 1 GENERAL

1.01 SUMMARY

A. Work Included: Provide all labor, materials, equipment, transportation, services, etc. necessary for completion of all finish carpentry and woodwork indicated on the Drawings and specified herein. Types of finish carpentry and woodwork include, but are not necessarily limited to, the following:
   1. Exterior plywood.
   2. Hanging doors.
   3. Installation of finish hardware.
   4. Installation of toilet accessories.

B. Related Work:
   1. Section 06100 - Rough Carpentry
   2. Section 08210 - Wood Doors and Frames
   3. Section 08700 - Finish Hardware
   4. Section 09900 - Painting

1.02 SUBMITTALS

A. Within 45 days after Contractor's receipt of Owner's Notice to Proceed, submit:
   1. Manufacturer's printed product information, including specifications, standard colors, and installation instructions; five (5) copies.

1.03 GUARANTEE

A. Per Section 01700; twelve (12) months.

1.04 QUALITY ASSURANCE

A. Standards:
   1. The Quality Standards of the Architectural Woodwork Institute (AWI) apply and by reference are made part of this Specification. All reference to "Premium, Custom, or Economy" grades in this Section shall be as defined in the latest edition of the AWI "Quality Standards".
   2. All items not given a specific quality grade shall be Custom grade.

B. Competence: Installers of this work shall be fully-experienced and fully-skilled finish carpenters only.

1.05 DELIVERY, STORAGE, AND HANDLING

A. Protection: Protect woodwork during transit, delivery, storage, and handling to prevent damage, soiling, and deterioration.

B. Delivery of Materials: Do not deliver woodwork until painting, wet work, grinding, and

similar operations which would damage, soil, or otherwise harm woodwork have been completed in installation areas. If, due to unforeseen circumstances, woodwork must be stored in other than installation areas, store only in areas which meet the requirements specified for installation areas.

1.06 PROJECT CONDITIONS

A. Temperature Control: Advise Contractor of temperature and humidity requirements for woodwork installation areas. Do not install woodwork until the required temperature and relative humidity have been stabilized in installation areas.

B. Tolerance: Maintain temperature and relative humidity as required for a tolerance of plus or minus one percent (1%) of the specified optimum moisture content until woodwork receives specified finishes. Maintain temperature and humidity conditions until acceptance of the work by the Owner.

C. Protection: Protect installed woodwork from damage by other trades until Owner's acceptance of the work. Advise Contractor of required protection procedures.

PART 2 PRODUCTS

2.01 GENERAL

A. Grade Stamps: Display grade mark and trademark of the association having jurisdiction on all pieces of wood. Omit marking of exposed surfaces and supply certificate of inspection for all pieces to receive transparent surfaces.

B. Maximum moisture content:
1. Finish lumber: 12%
2. Plywood: 15%
3. Hardwood: 9%

C. Fire-retardant treatment (where indicated on Drawings):
1. Interior: Dricon, Osmose, or approved equal.
2. Exterior: Koppers NCX, or approved equal.
3. Pressure-treat before milling, and bearing FR-S stamp of certification.

D. Quality Standards: AWI Sections 100 Grade I except as modified herein, and 200.

E. Kerf, groove, or route the backs of wide, flat members, including siding of 8 inch width or larger.

F. Interior Wood:
1. Douglas Fir, Hem Fir, Pine; Grade 'B' and better, vertical grain.

2.02 FASTENERS

A. Siding Nails: W.H. Maze Co. "double hot dip" zinc-coated 6d ring shank siding nails of length to penetrate 1-1/2 inches minimum into stud. Stainless steel or aluminum ring-

shanked siding nails are acceptable. Ordinary galvanized steel nails are not acceptable for siding applications.

B. Interior and Trim: Finish or casing nails. Other nails shall be standard types suitable for the purpose. Where exposed, nails shall be hot dip galvanized or aluminum.

C. Screws: As detailed. Corrosion resistant, Phillips head.

2.03 MEMBRANES

A. Building paper: Federal Specification UU-B-790a, kraft; "Sisalkraft" Orange Label, "Burke" VaporSeal Brownskin, or approved equal.

B. Felt: 15 pound asphalt-saturated inorganic, unperforated felt.

2.04 ADHESIVES

A. As recommended by paneling manufacturer.

2.05 OTHER MATERIALS

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

PART 3 EXECUTION

3.01 EXISTING CONDITIONS

A. Examine all areas and conditions under which this work will be performed, and verify that all such work is complete to the point that this installation may begin. Report all inadequate conditions to the Contractor. Do not proceed until unsatisfactory conditions are corrected. Start of work shall imply acceptance of existing conditions.

B. Measurements: Before proceeding with woodwork required to be fitted to other construction, obtain measurements and verify dimensions with all Shop Drawings details as required for accurate fit.

C. Preparation: Condition woodwork to average prevailing humidity conditions in installation areas prior to installing. Backprime woodwork on all surfaces which will be concealed with one coat of wood primer. Schedule delivery to allow time for application and drying of backprime coat before installation of woodwork.

D. Install building paper or felt underlayment in a weatherlap fashion prior to installation of exterior plywood or board sidings, and where shown at other locations in the Drawings.

3.02 GENERAL

A. Fabricate finish carpentry to dimensions, profiles, and details shown.

B. Install all items straight, true, level, plumb, and firmly anchored in place. Where blocking or backing is required, coordinate as necessary with other trades to ensure placement of blocking and backing in a timely manner.

C. Install this work with dry, tight, and well-nailed joints, assembled to conceal shrinkage. Miter all exterior corners; cope all interior corners; miter or scarf all end-to-end joints; miter and return all exposed ends.

3.03 INSTALLATION OF DOORS

A. Install wood doors and frames with double wedge blocking back of jambs at butts, lock strikes, and nailing points. Fit all wood doors accurately to their frames with an even margin at head and jambs with proper clearance threshold to clear the indicated floor coverings. As required during progress of the work, remove and reset doors and hardware for the installation of work of other trades.

3.04 INSTALLATION OF FINISH HARDWARE

A. Install all finish hardware in accordance with the "Hardware Schedule" described in Division 8 of these Specifications and in strict accordance with the manufacturer's recommendations. Unless otherwise indicated on the Drawings, set all finish hardware at the heights required by access codes.

3.05 INSTALLATION OF ACCESSORIES

A. Install all accessories in strict accordance with the manufacturer's instructions, taking special care to install firmly and securely with all anchors drawn up tight.

3.06 FINISHING

A. Provide exterior materials sufficiently early in the construction period for backpriming and/or matching finishing by others, so that installation is not delayed.

B. Interior Work:
1. Sandpaper all finished wood surfaces thoroughly as required to produce a uniformly smooth surface, always sanding in direction of the wood grain. No course grained sandpaper marks, sander waves, hammer marks, or other imperfections shall be permitted.
2. Fill all nail holes at interior work with stainable material matching the species of wood installed.

3.07 CLEAN-UP

A. During progress of work, do not allow the accumulation of debris or scrap resulting from this work. Immediately clean and repair sills or damage caused by this work to work of other trades.

B. Upon completion remove all resulting tools, surplus materials and rubbish, and leave entire installation in clean condition.

END OF SECTION

SECTION 06400
ARCHITECTURAL WOODWORK

PART 1 GENERAL

1.01 SUMMARY

A. Section Includes:
1. Architectural woodwork (mill fabricated as required for complete Project as indicated, including installation.)

B. Related Sections:
1. Section 06200 - Finish Carpentry

1.02 SUBMITTALS

A. Shop Drawings: Submit large scale drawings indicating materials, component profiles, fastening jointing, details, finishes, accessories, and dimensions when noted on shop drawing matrix.

1.03 QUALITY ASSURANCE

A. Architectural Woodwork Shall: Conform to American Woodwork Institute (AWI). Quality shall be Commercial Custom Grade.

B. Experience and Qualifications: Millwork fabricator to have minimum five years successful experience in fabricating, finishing and installing Custom Grade architectural woodwork as specified.
1. Provide sufficient mechanics skilled in architectural woodwork to produce premium quality product.
2. Upon request, provide information necessary to demonstrate successful experience in producing premium quality architectural woodwork.

C. Medium Density Fiberboard (MDF): Shall comply with ANSI A208.2 and ASTM e84 Class C (111) fire rating (76-200).

D. Plastic Laminate shall: Conform to the National Electrical Manufacturers Association (NEMA) LD#.

PART 2 PRODUCTS

2.01 MATERIALS

A. Lumber and Plywood: Graded in accordance with referenced standard for quality assurance: thickness indicated of Drawings.
1. Paneling: Provide fire-retardant treated core with flame spread rating of maximum 25 (ASTM E84): treatment which does not cause stains in finished system.

B. MDF: Medium Density Fiberboard.

C. Plastic Laminate: colors and textures as selected by Tenant.

D. Casework Hardware: as selected by Tenant.

2.02 FABRICATION

A. Shop assemble architectural woodwork in sizes easily handles and to ensure passage through building openings.

B. Shop fabricate and finish architectural woodwork to maximum extent possible allowing for shipping, handling, and access to final location of installation.

PART 3 EXECUTION

3.01 PREPARATION

A. Plastic Laminates: Apply in full uninterrupted sheets consistent with manufactured sizes, make corners and joints hairline, slightly bevel arises, locate butt joints minimum 2' – 0" from cutouts.

B. Use exposed fastening devices only when approved in advance and only when unavoidable: Arrange neatly.

3.02 INSTALLATION

A. Install under supervision of factory trained mechanics in conformance with referenced standards.

B. Provide cutouts and clearances for inserts, outlet boxes, and other fixtures. Prime paint contact surfaces of cutouts, using clear material on members having transparent finishes.

C. Verify locations of cutouts from on-site dimensions.

D. Securely anchor architectural woodwork to blocking in wall, plumb and level.

E. Carefully scribe cabinet work which is against other building materials, leaving gaps of 1/32" maximum. Do not use additional overlay trim.

F. After installation, adjust hardware.

END OF SECTION

SECTION 07120
FLUID APPLIED ELASTOMERIC WATERPROOFING

PART 1 GENERAL

1.01 SUMMARY

A. Section Includes:
1. Fluid applied fill coat and elastomeric finish waterproofing as indicated on drawings.

B. Related Sections:
1. Section 04100 - Mortar: Mortar joints.
2. Section 04220 - Unit Masonry: Concrete masonry units.
3. Section 09900 - Painting: Painting.

1.02 REFERENCES

A. American Society for Testing and Materials (ASTM):
1. ASTM G26 - Recommended practice for operating light exposure apparatus.
2. ASTM 1653 - Test method for permeability.
3. ASTM E96 - Test method for water vapor transmission of materials.

1.03 SUBMITTALS

A. Submit under provisions of Section 01300 and 01400.

B. Sample/Mock-up:
1. Submit two (2) wall samples of each color 6" x 6" in size indicating texture, color and finish.
2. Provide field sample/mock-up for color approval by Architect.

1.04 QUALITY ASSURANCE

A. Applicator: Company specializing in application of specified waterproofing with three years minimum experience, and approved by manufacturer.

B. Comply with applicable recommendations of the manufacturer.

C. Field Sample/Mock-up:
1. Provide 100 sq. ft. of field sample of installed membrane over CMU wall under provisions of Section 01400.
2. Field sample shall represent color and surfaces of finished work.
3. Contractor shall coordinate inspection of the field sample by the local manufacturers representative for approval prior to proceeding.
4. Approved sample may be incorporated as part of work.

1.05 ENVIRONMENTAL REQUIREMENTS

A. Comply with manufacturers recommendations on environmental requirements for storage, handling and installation.

B. Ambient Temperature Minimum of 50 F. air and surface temperature for 24 hours before, during and 24 hours after application, unless otherwise specified by coating manufacturer.

C. No precipitation for 24 hours preceding or predicted for 24 hours after application.

D. The following conditions may require dampening the surface prior to and during application:
   1. Wind-caused rapid drying of surface.
   2. Excessive surface temperature.
   3. Excessive air temperature.
   4. Direct sun.
   5. Low humidity.

E. Surfaces shall be protected to prevent rapid drying where heavy wind or hot sun exist.

F. Rapid changes in temperature should be avoided during curing to prevent thermal shock cracks in finish materials.

G. Surface temperature shall be maintained above 50 F. throughout application and curing of blockfiller system.

1.06 PRODUCT DELIVERY, STORAGE AND HANDLING

A. All manufactured materials shall be delivered in their original packages, containers and bundles bearing the name of manufacturer and brand. Store all materials off the ground under watertight cover and away from sweating walls and other damp surfaces until ready for use. Damaged or deteriorated materials must be removed from the premises immediately.

1.07 PROTECTION

A. During application of fill coat and elastomeric finish, protect work of other trades against undue soilage and damage by the exercise of reasonable care and precaution. Repair and/or replace any work so damaged or soiled as to be unsightly in Architect's judgment at no additional cost to Owner or Contact.

1.08 WARRANTY

A. Provide five year warranty under provisions of Section 01700.

B. Warranty: Include coverage of materials and installation and resultant damage from failure of installation to resist penetration of moisture.

1.09 PRE-APPLICATION MEETING

A. General Contractor shall arrange meeting no less than three (3) days prior to starting work.

B. Attendance:
   1. General Contractor.
   2. Coating Subcontractor.
   3. Representative of coating manufacturer.

C. Meeting Agenda:
   1. Substrate condition;
   2. Sequence and method of application of coating system.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. Acceptable Fluid Applied Waterproofing Manufacturers:
   1. Thoro System Products.

B. Substitutions: No substitutions will be allowed.

2.02 MATERIALS

A. Fill Coat: Cementitious, acrylic-modified waterproof blockfiller. Super Quickseal with Thorosheen, as manufactured by Thoro System Products.

B. Finish Coat: Acrylic polymer elastomeric waterproof coating. Thorolastic, as manufactured by Thoro System Products. Custom colors shall be as indicated on the drawings and within Section 09900 - Painting or as selected by the Architect.
Performance Requirements:
   1. Elongation: Minimum at break 400%
   2. Weathering (ASTM G 26 Xenon Arc) 5000 hours
   3. Permeability (ASTM D 1653, E 96) 12 perms
   4. Freeze/thaw (DOT Method A) 50 cycles
   5. Flexibility (Fed. Test 141,6221) no change

PART 3 EXECUTION

3.01 WORKMANSHIP

A. In cold and/or inclement weather, no work shall be started until area is adequately covered temporarily, so that a surface temperature of not less than 50 F. can be maintained during and up to completion of the drying process. Temporary heat shall be provided for, when necessary, as directed by the manufacturer. The use of portable space heaters to provide temporary heat is permitted.

B. Surfaces shall be free of defects such as mortar or grout droppings, laitance, dirt, dust, grease, form release treatments, efflorescence, curing compounds, paint and any other foreign materials.

C. Finish coat shall be of uniform color, texture and sheen, free from runs, drips, curtains, holidays, shiners and other imperfections.

3.02 MIXING

A. Mix in strict accord with printed instructions of manufacturer. Mechanical mixers of an

approved type shall be used for mixing. Frozen, caked or lumped materials shall not be used. Mechanical mixers and containers shall be cleaned after mixing; each batch kept free from previous mixes.

B. Thoroughly mix with proper amount of water until a creamy batter consistence is achieved, with uniform color.

C. Let material set for fifteen (15) minutes, then temper back.

D. The material may be re-tempered only one more time.

3.03 APPLICATION

A. Blockfiller:
1. Do not apply while wall is excessively wet.
2. Apply a heavy brush or roller coat to the surface at the rate of 100 sq. ft. per gallon over flat face block, or approximately 75 sq. ft. per gallon over fluted or split face block, depending on the roughness of the block.
3. Using a wet and clean brush, work the fill coat in a horizontal manner to fill surface imperfections. Lay off base coat with vertical strokes. Backroll surface with 3/4" nap roller with downward finish strokes to remove brush marks. Do not let the material set or harden before backrolling.
4. Let the fill coat set for 24 hours. Apply a light fog spray of clean, potable water on the second day if conditions are hot and/or windy.

B. Finish Coat:
1. Stir thoroughly with a metal paddle or electric mixer to assure a complete, uniform dispersion throughout.
2. In extremely hot, dry weather slight dampening of the surface with clean water is acceptable prior to the application.
3. Apply the FIRST COAT according to the manufacturer's printed recommendations with texture to be determined by the Architect.
4. Apply the SECOND COAT according to the manufacturer's printed recommendations with color and texture to be determined by the Architect.
5. Finish product should have a dry film thickness of 18-20 dry mils pinhole free.
6. Apply base coat of smooth texture uniformly over entire surface. Then apply second coat in the desired texture.
7. Clean equipment immediately after application is completed with clean water. Dried film can be removed with xylonal.
8. Do not apply if surface temperature is below 40 F. or expected to fall below 40 F. within 24 hours.

C. The following conditions may require dampening the surface prior to and during application:
1. Wind causing rapid drying of surface;
2. Hot surface temperature;
3. Hot air temperature;
4. Direct sun;
5. Low humidity.

3.04 COMPLETION

A. Dry Film Thickness Inspection:
1. Measure coating upon completion of application, using precision instrument

designed for measuring coating dry film thickness.

2. Recoat any work measuring less than thickness specified by coating manufacturer.
3. Touch-up test surface as recommended by coating manufacturer.

B. Final Cleaning:
   1. Remove splattered coating from adjacent windows, doors, flashings, and concrete walkways, as recommended by coating manufacturer.

C. Manufacturers Letter of Completion:
   1. Provide letter of completion and acceptance from the manufacturer verifying dry film thickness and application.

3.05 INSPECTION AND SCHEDULE

A. Contractor shall maintain schedule of application in field office for Architect's inspection.

END OF SECTION

SECTION 07210
BUILDING INSULATION

PART 1 GENERAL

1.01 SUMMARY

A. Section Includes:
1. Batt insulation, rigid insulation and vapor barrier at interior thermal walls.
4. Sound control insulation at interior walls.

B. Related Sections:
1. Section 06112 - Framing and Sheathing: Supportive construction.
2. Section 09110 - Non-Load Bearing Metal Framing: Supportive construction.
3. Section 09250 - Gypsum Board.
54 Division 15 - Mechanical: Piping and duct insulation.

1.02 REFERENCES

A. American Society for Testing and Materials (ASTM):
1. ASTM C665 - Mineral Fiber Blanket Thermal Insulation for Light Frame Construction and Manufactured Housing.

B. Federal Specifications (FS):
1. FS HH-I-521 - Insulation Blankets, Thermal, (Mineral Fiber for Ambient Temperatures).
2. FS HH-I-558 - Insulation, Blocks, Boards, Blankets, Felts, Sleeving (Pipe and Tube Covering), and Pipe Fitting Covering, Thermal (Mineral Fiber, Industrial Type).

1.03 PERFORMANCE REQUIREMENTS

A. Materials of this Section shall provide continuity of thermal barrier at building enclosure elements.

1.04 COORDINATION

A. Coordinate Work under provisions of Section 01039.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. Acceptable Batt Insulation Manufacturers:
1. Dow Chemical Co.
2. Owens Corning
3. Certainteed.

B. Substitutions: Under provisions of Section 01600.

2.02 MATERIALS

A. Thermal Batt Insulation: FS HH-I-521 Type I - without membranes or Type II - with non-reflective membrane one side, ASTM C665; preformed mineral fiber batt, conforming to following:
   1. Thermal Resistance: R – 19.
   2. Facing: FSK 25

B. Sound Control Insulation: FS HH-I-521 Type I - without membranes; mineral fiber batt, friction fit, conforming to following:
   1. 3-1/2" or 6" thick (fill stud space full depth of stud).
   2. Facing: Unfaced.

D. Vapor/Air Barrier: Barrier at walls:
   1. Flame retardant polyethylene sheets 4 mil. minimum thickness.

E. Rigid Wall Insulation: At interior masonry walls.
   1. 1-1/2” Dow Styrofoam “Cavitymate Plus”, or equal
   2. Thermal Resistance: R 7.5

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify that substrate, adjacent materials, and insulation are dry and ready to receive insulation.

3.02 INSTALLATION

A. Install insulation and vapor barrier in accordance with insulation manufacturer's instructions.

B. Install in spaces without gaps or voids.

C. Trim insulation neatly to fit spaces. Fit insulation tight in spaces and tight to exterior side of mechanical and electrical services within plane of insulation. Leave no gaps or voids.

D. Install with factory applied membrane facing warm side of building spaces. Lap ends and side flanges of membrane over framing members.

E. Wall insulation: Staple or nail in place at maximum 6 inches oc.

F. Tape seal butt ends, lapped flanges, and tears or cuts in membrane.

G. Extend vapor and air barrier tight to full perimeter of adjacent window and door frames and other items interrupting the plane of membrane. Tape seal in place.

H. Install Sound Control Insulation at all framed demising walls. Extend insulation from floor to bottom of sheathing.

END OF SECTION

SECTION 07412
METAL ROOFING AND WALL CLADDING [ADD A]

PART 1 - GENERAL

1.01 SUMMARY

A. Section Includes:
1. Roll form and press break formed sheet steel roof and wall panels as indicated on Drawings and specified herein.
2. Flashings, closures, fasteners, and all trim required for a weatherproof system.

B. Related Sections:
1. Section 06112 - Framing and Sheathing: Structure.
2. Section 07600 - Flashings and Sheet Metal: Wall Caps and Flashings.
3. Section 07900 - Sealants: Sealants.

1.02 REFERENCES

A. American National Standards Institute/American Society for Testing and Materials (ANSI/ASTM):
1. ANSI/ASTM B32 - Solder Metal.

B. American Society for Testing and Materials (ASTM):
1. ASTM A361 - Steel Sheet, Zinc-Coated (Galvanized) by the Hot-Dip Process for Roofing and Siding.
2. ASTM D226 - Asphalt-Saturated Organic Felt Used in Roofing and Waterproofing.

C. National Association of Architectural Metal Manufacturers (NAAMM):
1. NAAMM - Metal Finish Handbook.

D. National Roofing Contractors Association (NRCA):
1. NRCA - Roofing Manual.

E. Sheet Metal and Air Conditioning Contractors' National Association (SMACNA):
1. SMACNA - Architectural Sheet Metal Manual.

1.03 PERFORMANCE REQUIREMENTS

A. Testing and Certification.
1. Wind Uplift: UL 580 test: Panels rated Class 90 with roof fastener clips spaces 18" on center maximum (wide batten only) and 24" on center maximum (narrow batten only).

1.04 SUBMITTALS

A. Shop Drawings: Submit detailed drawings showing typical fastener layout and types of materials and accessories to be used. Include gauges, anchorage details, and details of panels at closures.

B. Office Sample: Submit three (3) 3"x5"samples of panel with finish color specified and a 12 inch long, full width sample of preformed panels showing lap and connection details. Include typical top and bottom edge trim, miter joint and fasteners. Obtain review from Architect prior to fabrication.

1.05 PRODUCT DELIVERY, STORAGE AND HANDLING

A. Protect against damage and discoloration.

B. Handle panels with non-marring slings.

C. Do not bend panels.

D. Store panels above ground, width one end elevated for drainage.

E. Protect panels against standing water and condensation between adjacent surfaces.

F. If panels become wet, immediately separate sheets, wipe dry with clean cloth and allow to air dry.

G. Painted panels shall be shipped with plastic sheeting or a strippable film coating between all panels.

H. Remove any strippable film coating prior to installation and in any case, do not allow the strippable film coating to remain on the panels in extreme heat, cold or in direct sunlight or other UV source.

1.06 PROJECT CONDITIONS

A. Examine the conditions and substrates in which metal roofing work is to be installed. Substrate shall be installed leave, flat and true to avoid panel stresses.

B. Field measurements shall be taken prior to fabrication of panels.

C. Proceed with roofing installation only after satisfactory conditions are met.

1.07 WARRANTY

A. Provide installers written warranty against defects in materials and workmanship for a period of not less than five (5) years.

B. Provide manufacturer's written warranty for heavy coated steel sheets for a period of not less than twenty (20) years.

PART 2 - PRODUCTS

2.01 APPROVED FABRICATORS

A. Acceptable Fabricators:
   1. Carlisle Engineered Metal, Inc.

3. Custom-Bilt Metals
4. Pacific Metals

B. Substitutions are not allowed.

2.02 STEEL PANELS

A. 24 gauge ASTM A 792, Grade 40 steel with galvanized coating per ASTM A 792, A250.

B. Provide BHP Metals Profile Select Seam or Carlisle SA Panel with batten or seam as indicated on drawings.

C. Roll form or press break with suitable protection to prevent chafing or fracture of the prefinished paint surface. Field measure prior to fabrication. Adjust individual pan widths to equalize areas rather than finishing with one odd sized sheet.

D. Panels shall be complete, continuous lengths. No panels shall be spliced together for any reason.

2.03 FASTENERS

A. Concealed: Galvanized steel clips with plated screws.

2.04 SEALANTS

A. Vulkem urethane sealant, gun grade per federal specification TT-S-230c.

B. Clear silicone sealant, gun grade per federal specification TT-S-001543 A Type I.

2.05 FINISH

A. Exterior finish of 0.2 mil thick corrosion-resistant primer and 0.8 mil thick finish coat of Kynar 5007 for a total of 1.0 mil dry film thickness.
1. Color: (Choose one)
a. See drawings.

Configuration:
b. Narrow Batten: Roof panels shall consist of snap-on batten caps, 1/4” wide and 1” high spaced 16-1/4" on center and a nominal panel width of the same. Panels shall be factory corrective leveled.

B. Accessories.
1. Fastener Clips:
a. UL-90 assembly rated clip: 24 gauge steel coated with minimum G-60 Galvanized per ASTM A-525.
2. Fasteners:
a. Per manufacturer recommendation.
3. Sealant:
a. Gunnable Grade Caulking: Single component Urethane Caulk.
b. Tape Sealant: Butyl.

4. Backer Rod: Locate neoprene backer rod at mid-span of each panel.

C. Flashing.
1. Material, gauge and finish to match panels. Do not use lead or copper. Remove any strippable film prior to installation.

D. Fabrication.
1. Unless otherwise shown on drawings or specified herein, fabricate panels in continuous one-piece lengths and fabricate flashings and accessories in longest practical lengths.
2. Roofing panels shall be factory formed. Field framed panels are not acceptable.

PART 3 - INSPECTION

3.01 INSPECTION

A. Examine substrate and conditions under which work is to be installed. Do not proceed with installation until satisfactory conditions have been corrected, and until acceptable framing tolerances have been achieved as determined by the manufacturer, supplier, and installer. Warping, buckling and other distortions within the finished metal roofing will not be acceptable.

B. Verify all field dimensions prior to fabrication.

3.02 INSTALLATION

A. Install in accordance with reviewed shop drawings and manufacturer's directions.
B. Install 30# type felt paper to plywood roof sheathing prior to placement of metal roof panels and associated flashings.

C. Install in continuous lengths and locations indicated on Drawings. Provide panel joints only where indicated on Drawings.

D. Panels shall only be fastened with concealed panel clips.

E. Install backer rod at mid span of panels. Stop rod 2' from each end of panels.

F. Align exposed fasteners and equally space by using shop pre-punch holes.

F. Seal panel joints with continuous sealant as required. Install entire assembly weather-tight.

G. All exposed cut edges shall be touched up with material compatible and matching the color of the adjacent prefinished surface.

3.03 ADJUSTMENTS: Replace or repair and touch-up panels damaged or scratched prior to Owner acceptance.

END OF SECTION

SECTION 07542
THERMOPLASTIC-POLYOLEFIN ROOFING

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. This Section includes the following:

1. Mechanically fastened membrane roofing system.
2. Roof insulation.
3. Vapor retarder.
4. Substrate board.

B. Related Sections include the following:

1. Division 05 Section "Steel Decking" for furnishing acoustical deck rib insulation.
2. Division 06 Section "Rough Carpentry for wood nailers, curbs, and blocking.
3. Division 07 Section "Thermal Insulation" for insulation beneath the roof deck.
4. Division 07 Section "Sheet Metal Flashing and Trim" for metal roof penetration flashings, flashings, and counterflashings.
5. Division 07 Section "Manufactured Roof Expansion Joints."
6. Division 07 Section "Joint Sealants."
7. Division 22 Section "Storm Drainage Piping Specialties" for roof drains.

1.3 DEFINITIONS

A. Roofing Terminology: Refer to ASTM D 1079 “Terminology Relating to Roofing and Waterproofing”; glossary of NRCA's "The NRCA Roofing and Waterproofing Manual"; and the Roof Consultants Institute “Glossary of Roofing Terms” for definition of terms related to roofing work in this Section.

B. Sheet Metal Terminology and Techniques: SMACNA Architectural Sheet Metal Manual.

1.4 PERFORMANCE REQUIREMENTS

A. General: Provide installed roofing membrane and Flashings that remain watertight; do not permit the passage of water; and resist specified uplift pressures, thermally induced movement, and exposure to weather without failure.

B. Material Compatibility: Provide roofing materials that are compatible with one another under conditions of service and application required, as demonstrated by roofing membrane manufacturer based on testing and field experience.

C. Jobsite Safety: Execute all operations and provide a safe work environment in accordance to OSHA standards and regulations. This requirement applies to all contractor personnel, associated subcontractors, workers in other trades, and jobsite visitors.

1. Follow all industry fire prevention guidelines for storage of materials, staging areas, roof access, and application means and methods.
2. Any applicable local fire codes supersede industry guidelines.

D. Roofing System Design: Provide a membrane roofing system that is identical to systems that have been successfully tested by a qualified testing and inspecting agency to resist uplift pressure calculated according to ASCE 7.

1.5 SUBMITTALS

A. Product Data: For each type of product indicated.

B. Shop Drawings: For roofing system. Include plans, elevations, sections, details, and attachments to other Work.

1. Flashings and membrane terminations.
2. Tapered insulation, including slopes.
3. Insulation fastening patterns.
4. Sheet layout with perimeter and corner defined.

C. Samples for Verification: For the following products:

1. Manufacturer’s standard sample size of sheet roofing, of color specified, including T-shaped side and end lap seam.
2. Manufacturer’s standard sample size of walkway pads or rolls.
3. Manufacturer’s standard sample size of roof insulation.
4. Manufacturer’s standard sample size of metal termination bars.
5. Manufacturer’s standard sample size of battens.
6. Manufacturer’s standard sample size of vapor retarder.
7. Manufacturer’s standard sample size of substrate board.
8. Six insulation fasteners of each type, length, and finish.
9. Six roof cover fasteners of each type, length, and finish.
10. Six fasteners or each type, length and finish used for complete roofing installation.

D. Installer Certificates: Signed by roofing system manufacturer certifying that Installer is approved, authorized, or licensed by manufacturer to install roofing system.

E. Manufacturer Certificates: Signed by roofing manufacturer certifying that roofing system complies with requirements specified in "Performance Requirements" Article.

1. Submit evidence of meeting performance requirements.

F. Qualification Data: For Installer and manufacturer.

G. Product Test Reports: Based on evaluation of comprehensive tests performed by manufacturer and witnessed by a qualified testing agency, for components of roofing system.

H. Research/Evaluation Reports: For components of membrane roofing system.

I. Maintenance Data: For roofing system to include in maintenance manuals.

J. Warranties: Special warranties specified in this Section.

1.6 QUALITY ASSURANCE

A. Installer Qualifications: A qualified firm that is approved, authorized, or licensed by roofing system manufacturer to install manufacturer's product and that is eligible to receive manufacturer's warranty.

B. Manufacturer Qualifications: A qualified manufacturer that has UL listing for membrane 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. Test Reports:

1. Roof drain and leader test or submit plumber’s verification.
2. Core cut (if requested).

3. Roof deck fastener pullout test.

E. Moisture Survey:

1. Submit prior to installation, results of a non-destructive moisture test of roof system completed by approved third party. Utilizing one of the approved methods:

a. Infrared Thermography
b. Nuclear Backscatter

F. Source Limitations: Obtain all components from single source roofing manufacturer.

G. Fire-Test-Response Characteristics: Provide membrane 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.

H. Preliminary Roofing Conference: Before starting roof deck construction, conduct conference at Project site. Comply with requirements for preinstallation conferences in

Division 01 Section "Project Management and Coordination." Review methods and procedures related to roof deck construction and roofing system including, but not limited to, the following:

1. Meet with Owner, Architect, Owner's insurer if applicable, testing and inspecting agency representative, roofing Installer, roofing system manufacturer's representative, deck Installer, and installers whose work interfaces with or affects roofing including installers of roof accessories and roof-mounted equipment.
2. Review methods and procedures related to roofing installation, including manufacturer's written instructions.
3. Review and finalize construction schedule and verify availability of materials, Installer's personnel, equipment, and facilities needed to make progress and avoid delays.
4. Examine deck substrate conditions and finishes for compliance with requirements, including flatness and fastening.
5. Review structural loading limitations of roof deck during and after roofing.
6. Require that all complimentary trades be present at conference. Including, but not limited to; electrical, plumbing, HVAC, and framing contractors.
7. Review Flashings, special roofing details, roof drainage, roof penetrations, equipment curbs, and condition of other construction that will affect roofing system.
8. Review governing regulations and requirements for insurance and certificates if applicable.
9. Review temporary protection requirements for roofing system during and after installation.
10. Review roof observation and repair procedures after roofing installation.

I. Preinstallation Conference: Conduct conference at Project site. Comply with requirements in Division 01 Section "Project Management and Coordination." Review methods and procedures related to roofing system including, but not limited to, the following:

1. Meet with Owner, Architect, Owner's insurer if applicable, testing and inspecting agency representative, roofing Installer, roofing system manufacturer's representative, deck Installer, and installers whose work interfaces with or affects roofing including installers of roof accessories and roof-mounted equipment.
2. Review methods and procedures related to roofing installation, including manufacturer's written instructions.
3. Review and finalize construction schedule and verify availability of materials, Installer's personnel, equipment, and facilities needed to make progress and avoid delays.
4. Examine deck substrate conditions and finishes for compliance with requirements, including flatness and fastening.
5. Review structural loading limitations of roof deck during and after roofing.
6. Review Flashings, special roofing details, roof drainage, roof penetrations, equipment curbs, and condition of other construction that will affect roofing system.
7. Review governing regulations and requirements for insurance and certificates if applicable.
8. Review temporary protection requirements for roofing system during and after installation.
9. Review roof observation and repair procedures after roofing installation.

1.7 DELIVERY, STORAGE, AND HANDLING

A. Deliver roofing materials to Project site in original containers with seals unbroken and labeled with manufacturer's name, product brand name and type, date of manufacture, and directions for storing and mixing with other components.

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. Protect stored liquid material from direct sunlight.

1. Discard and legally dispose of liquid material that cannot be applied within its stated shelf life.

C. Protect roof insulation materials from physical damage and from deterioration by sunlight, moisture, soiling, and other sources. Store in a dry location. 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 existing and forecasted weather conditions permit roofing system to be installed according to manufacturer's written instructions and warranty 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 warranty includes roofing membrane, Flashings, roofing membrane accessories, roof insulation, fasteners, 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. Warranty Period: 20 years from date of Substantial Completion.

B. Installer’s Guarantee: Submit roofing Installer's warranty, on warranty form at end of this Section, signed by Installer, covering Work of this Section, including all components of roofing system such as roofing membrane, Flashing, roof insulation, fasteners, cover boards, substrate boards, vapor retarders, roof pavers, and walkway products, for the following warranty period:

1. Warranty Period: Two years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 MANUFACTURER

A. Basis of Design: Johns Manville Roofing Systems

2.2 THERMOPLASTIC POLYOLEFIN ROOFING MEMBRANE

A. Fabric-Reinforced Thermoplastic Polyolefin Sheet: ASTM D 6878, uniform, flexible sheet formed from a thermoplastic polyolefin, internally fabric or scrim reinforced. Product: JM TPO

1. Thickness: 60 mils (1.5 mm), nominal.
2. **UL 790 non-combustible assembly required [ADD A}**

2.3 AUXILIARY 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.
2. Liquid-type auxiliary materials classified as No VOC.

B. Sheet Flashing: Manufacturer's sheet flashing of same material, type, reinforcement, thickness, and color as sheet membrane. Product: JM TPO

C. Sheet Flashing: Manufacturer's unreinforced sheet flashing of same material as sheet membrane. Product: JM TPO Detail Membrane

D. Bonding Adhesive: Manufacturer's standard water-based bonding adhesive for membrane, and solvent-based bonding adhesive for Flashings. Product: JM TPO Membrane Adhesive (Low VOC)

E. Metal Termination Bars: Manufacturer's standard predrilled stainless-steel or aluminum bars, with anchors. Product: JM Termination Systems

F. Metal Battens: Manufacturer's standard aluminum-zinc-alloy-coated or zinc-coated steel sheet, prepunched. Product: Membrane Battens

G. 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. Product: High Load Fasteners and Plates, or as recommended by the supplier

H. 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 patented bifurcation process. Provide product manufactured and marketed by single-source membrane supplier that is

included in the No Dollar Limit guarantee. Product: Expand-O-Flash, or as recommended by the supplier

I. 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. Product: Presto-Lock Coping

J. 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. Product: Presto Lock Fascia, or as recommended by the supplier.

K. 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. Products: As recommended by the supplier

2.4 WALKWAYS

A. Flexible Walkways: Factory-formed, nonporous, heavy-duty, slip-resisting, surface-textured walkway pads sourced from membrane roofing system manufacturer. Product: JM TPO Walkpad

2.5 ROOF INSULATION

A. General: Provide 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, Product: ENRGY 3

1. Provide insulation package with R Value greater than 21
2. Provide insulation package with minimum thickness to achieve R Value.
3. Install no boards thicker than 1.5". If insulation package required is thicker than 1.5", install in multiple layers.

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, unless otherwise indicated. Product: Tapered ENRGY 3

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. Product: As recommended by the supplier

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 provided by roofing system manufacturer. Product: As recommended by the supplier.

D. Cold Fluid-Applied Adhesive: Manufacturer's No VOC, two-component cold fluid-applied adhesive formulated to adhere roof insulation to substrate. Product: MBR Bonding Adhesive

E. Urethane Adhesive: Manufacturer's two component urethane adhesive formulated to adhere insulation to substrate. Product: JM Green Two-Part Urethane Insulation Adhesive

F. Insulation Cant Strips: ASTM C 728, perlite insulation board. Product: FesCant Plus

G. Wood Nailer Strips: Comply with requirements in Division 06 Section "Rough Carpentry."

2.8 VAPOR RETARDER

A. Polyethylene Air Barrier: ASTM D 4397, 6 mils thick, minimum, with maximum permeance rating of 0.13 perm

1. Tape: Pressure-sensitive tape of type recommended by vapor-retarder manufacturer for sealing joints and penetrations in vapor retarder.
2. Adhesive: Manufacturer's standard lap adhesive, FMG approved for vapor-retarder application.

B. Torch Applied SBS Vapor Retarder : ASTM D 6163, Grade S, Type I, glass-fiber-reinforced SBS-modified asphalt sheet; smooth surfaced; suitable for application method specified. Product: As recommended by the supplier.

C. Glass-Fiber Felts: ASTM D 2178, Type IV, asphalt-impregnated, glass-fiber felt. Product: GlasPly IV

2.9 SUBSTRATE BOARD

A. Substrate Board: ASTM C 1177/C 1177M, glass-mat, water-resistant gypsum substrate, 1/4 inch thick. Product: Securock.

B. Substrate Board: ASTM C 728, perlite board, 3/4 inch thick, seal coated. Product: Fesco Board.

C. Fasteners: Factory-coated steel fasteners and metal or plastic plates meeting corrosion-resistance provisions in FMG 4470, designed for fastening substrate panel to roof deck. Product: As recommended by the supplier.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine substrates, areas, and conditions, with Installer present, for compliance with the following requirements and other conditions 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 substrate of dust, debris, moisture, and other substances detrimental to roofing installation according to roofing system manufacturer's written instructions. Remove sharp projections.

B. Prevent materials from entering and clogging roof drains and conductors and from spilling or migrating onto surfaces of other construction. Remove roof-drain plugs when no work is taking place or when rain is forecast.

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

3.3 RE-ROOF PREPARATION

A. Remove all roofing membrane, surfacing, coverboards, insulation, fasteners, asphalt, pitch, adhesives, etc.

1. Remove an area no larger than can be re-roofed in one day.

B. Tear out all base flashings, counterflashings, pitch pans, pipe flashings, vents and like components necessary for application of new membrane.

C. Remove abandoned equipment curbs, skylights, smoke hatches, and penetrations.

1. Install decking to match existing as directed by Owner's Representative.

D. Raise, (disconnect by licensed craftsmen, if necessary) all HVAC units and other equipment supported by curbs to conform with the following:

1. Modify curbs as required to provide a minimum 8" base flashing height measured from the surface of the new membrane to the top of the flashing membrane.
2. Nail top of flashing and install new metal counterflashing prior to re-installation of unit.
3. Perimeter nailers must be elevated to match elevation of new roof insulation.

E. Immediately remove all debris from roof surface. Demolished roof system may not be stored on the roof surface.

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

3.4 SUBSTRATE BOARD INSTALLATION

A. Install substrate board with long joints in continuous straight lines, perpendicular to roof slopes with end joints staggered between rows. Tightly butt substrate boards together.

1. Fasten substrate board to top flanges of steel deck according to recommendations in FMG's "Approval Guide" for specified Windstorm Resistance Classification.
2. Fasten substrate board to top flanges of steel deck to resist uplift pressure at corners, perimeter, and field of roof according to roofing system manufacturer's written instructions.

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

3.5 VAPOR-RETARDER INSTALLATION

A. Loosely lay polyethylene-sheet vapor retarder in a single layer over area to receive vapor retarder, side and end lapping each sheet a minimum of 2 inches and 6 inches , respectively.

1. Seal side and end laps with adhesive.

B. Install modified bituminous vapor retarder sheet according to roofing manufacturer's written instructions, starting at low point of roofing system. Extend roofing membrane sheets over and terminate beyond cants, installing as follows:

1. Torch apply to substrate.
2. Unroll roofing membrane sheets and allow them to relax for minimum time period required by manufacturer.

C. Laps: Accurately align roofing membrane sheets, without stretching, and maintain uniform side and end laps. Stagger end laps. Completely bond and seal laps, leaving no voids.

1. Repair tears and voids in laps and lapped seams not completely sealed.
2. Apply roofing granules to cover exuded bead at laps while bead is hot.

D. Install 2 glass-fiber felt plies lapping each sheet 19 inches over preceding sheet. Embed each sheet in a solid mopping of hot roofing asphalt. Glaze-coat completed surface with hot roofing asphalt. Apply hot roofing asphalt at a rate of 20 lb/100 sq. ft. (1 kg/sq. m), plus or minus 25 percent.

E. Completely seal vapor retarder at terminations, obstructions, and penetrations to prevent air movement into roofing system.

F. Completely seal vapor retarder at terminations, obstructions, and penetrations to prevent air movement into membrane roofing system.

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

3.6 INSULATION INSTALLATION

A. Coordinate installing roof system components so insulation is not exposed to precipitation or left exposed at the end of the workday.

B. Comply with roofing system manufacturer's written instructions for installing roof insulation.

C. Insulation Cant Strips: Install and secure preformed 45-degree insulation cant strips at junctures of roofing membrane system with vertical surfaces or angle changes greater than 45 degrees per manufacturer’s instruction.

D. Install tapered insulation under area of roofing to conform to slopes indicated.

E. Install insulation with long joints of insulation in a continuous straight line with end joints staggered between rows, abutting edges and ends between boards. Fill gaps exceeding 1/4 inch with insulation.

1. Cut and fit insulation within 1/4 inch of nailers, projections, and penetrations.

F. Install one or more layers of insulation under area of roofing to achieve required thickness. Where overall insulation thickness is 1.5 inches or greater, install 2 or more layers with joints of each succeeding layer staggered from joints of previous layer a minimum of 6 inches in each direction.

G. Trim surface of insulation where necessary at roof drains so completed surface is flush and does not restrict flow of water.

H. Install tapered edge strips at perimeter edges of roof that do not terminate at vertical surfaces.

I. Preliminarily Fastened Insulation: Install insulation with fasteners at rate required by roofing system manufacturer or applicable authority, which ever is more stringent.

J. 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 roof insulation to deck type.

1. Fasten first layer according to requirements in FMG's "Approval Guide" for specified Windstorm Resistance Classification.

2. Fasten first layer to resist uplift pressure at corners, perimeter, and field of roof.

3. Install subsequent layers in a cold fluid-applied adhesive.
4. Install subsequent layers in a two-part urethane adhesive.

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

3.7 MECHANICALLY FASTENED ROOFING MEMBRANE INSTALLATION

A. Install roofing membrane specification ST6RM over area to receive roofing according to roofing system manufacturer's written instructions. Unroll roofing membrane and allow to relax before installing.

B. Start installation of roofing membrane in presence of roofing system manufacturer's technical personnel.

C. Accurately align roofing membranes and maintain uniform side and end laps of minimum dimensions required by manufacturer. Stagger end laps.

D. Mechanically fasten roofing membrane securely at terminations, penetrations, and perimeter of roofing.

E. Always install membrane laps perpendicular to the steel deck flutes. “Picture Frame” installation method is not permitted.

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. In-Splice Attachment: Secure one edge of roofing membrane using fastening plates or metal battens centered within membrane splice and mechanically fasten roofing membrane to roof deck. Field-splice seam.

J. Through-Membrane Attachment: Secure roofing membrane using fastening plates or metal battens and mechanically fasten roofing membrane to roof deck. Cover battens and fasteners with a continuous cover strip.

K. Install roofing membrane and auxiliary materials to tie in to existing roofing.

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

3.8 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. Clean seam areas and overlap and firmly roll sheet flashings into the adhesive. Weld side and end laps to ensure a watertight seam installation.

E. Terminate and seal top of sheet flashings and mechanically anchor to substrate through termination bars.

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

3.9 WALKWAY INSTALLATION

A. Flexible Walkways: Install walkway products in locations indicated. Heat weld to substrate or adhere walkway products to substrate with compatible adhesive according to roofing system manufacturer's written instructions.

3.10 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 technical personnel 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 membrane 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.

3.11 PROTECTING AND CLEANING

A. Protect membrane roofing system from damage and wear during remainder of construction period. When remaining construction will not affect or endanger roofing, inspect roofing for deterioration and damage, describing its nature and extent in a written report, with copies to Architect and Owner.

B. Correct deficiencies in or remove membrane roofing system that does not comply with requirements, repair substrates, and repair or reinstall membrane roofing system to a condition free of damage and deterioration at time of Substantial Completion and according to warranty requirements.

C. Clean overspray and spillage from adjacent construction using cleaning agents and procedures recommended by manufacturer of affected construction.

END OF SECTION

SECTION 07600
FLASHING AND SHEET METAL

PART 1 GENERAL

1.01 SUMMARY

A. Section Includes:
1. Coping and cap flashings.
2. Overflows and scuppers.
3 Roof flashings.
4. Counterflashings over bituminous base flashings.
5. Counterflashings at roof mounted mechanical equipment and vent stacks.
6. Counterflashings for roof hatches.
7. Precoated galvanized steel gutters and downspouts.

B. Related Sections:
1. Section 06112 - Framing and Sheathing: Wood blocking, nailers, and grounds.
2. Section 07542 – Single Ply Roofing.
3. Section 07722 - Roof Hatches.
4. Section 07900 - Sealants.
5. Section 09900 - Painting: Prime and finish painting.
6. Section 15000 - Mechanical
7. Division 16000 - Electrical

1.02 REFERENCES

A. American Society for Testing and Materials (ASTM):
1. ASTM A525 - Steel Sheet, Zinc Coated, (Galvanized) by the Hot-Dip Process.

B. Federal Specifications (FS):
1. FS SS-C-153 - Cement, Bituminous, Plastic.

C. National Association of Architectural Metal Manufacturers (NAAMM):
1. NAAMM - Metal Finishes Handbook.

D. Sheet Metal and Air Conditioning Contractors National Association (SMACNA):
1. SMACNA - Architectural Sheet Metal Manual.

1.03 SYSTEM DESCRIPTION

A. Work of this Section is to physically protect roofing, base flashings and building systems from damage that would permit water leakage to building interior.

1.04 SUBMITTALS

A. Submit under provisions of Section 01300.

B. Shop Drawings: Describe material profile, jointing pattern, jointing details, fastening methods, and installation details.

1.05 QUALITY ASSURANCE

A. Applicator Qualifications: Company specializing in sheet metal flashing work with three years minimum experience.

B. Conform to SMACNA Manual for nominal sizing of components for rainfall intensity determined by storm occurrence of 1 in 10 years.

1.06 STORAGE AND HANDLING

A. Deliver products to site, store, handle and protect under provisions of Section 01600.

B. Stack preformed and prefinished material to prevent twisting, bending, or abrasion, and to provide ventilation.

C. Prevent contact with materials during storage which may cause discoloration, staining, or damage.

1.07 TOLERANCES

A. Fabricate and install sheet metal with lines, brakes, and angles sharp and true, and surfaces free form objectional wave, warp, or buckle. Fold exposed edges of sheet metal back to form 1/2 inch wide hem on side concealed from view, or as indicated on drawings.

B. Finish work shall be free from water leakage under all weather conditions. Workmanship and methods employed for forming, anchoring, cleating, and forming of expansion and contraction joints of sheet metal work, must conform to details and description in reference standards unless otherwise indicated on Drawings.

C. Where sheet metal abuts or joins adjacent dissimilar metals, execute joint to facilitate drainage and minimize possibility of galvanic action.

1.08 WARRANTY

A. Provide installers written warranty against defects in materials and workmanship for a period of not less than five (5) years.

PART 2 PRODUCTS

2.01 SHEET MATERIALS

A. Heavy Coated Exposed Steel:
   1. Metal: 24 or 20 gauge galvanized steel. ASTM A 525, Grade A, G90 galvanized coating.
   2. Finish: 1.0 mil. dry film thickness, Kynar 500 meeting AAMA 605.1 standards. Colors shall be prefinished [standard] [custom] colors as selected by Architects. Provide prefinished metal for all components except for copings, leader boxes, gutters, and downspouts which will be pre-primed and field painted.

3. Back coat: Epoxy primer, or approved equal.

B. Pre-Primed Galvanized Steel: ASTM A525, G90; 24 gauge core steel, shop pre-coated with zinc chromate coating of selected color.

2.02 COMPONENTS

A. Gutters: As indicated on drawings, per SMACNA requirements.

B. Downspouts: Rectangular profile.

C. End Caps, Downspout Outlets, Gutter Downpout Straps, Support Brackets, Joint Fasteners, Down Spout Strainers: Profiled to suit scuppers and downspouts.

D. Splash Blocks: Precast concrete type, minimum 3000 psi at 28 days, with minimum 5 percent air entrainment.

E. Lead Flashing: Use lead flashing at sumps, scuppers, pipe roof penetrations at roof areas.

2.03 ACCESSORIES

A. Fasteners: Galvanized steel with soft neoprene washers at exposed fasteners. Finish exposed fasteners same as flashing metal.

B. Anchorage Devises for Gutters and Downspouts: Type recommended by fabricator for specific application.

C. Downspout Supports: Straps, 2 inches wide.

D. Underlayment: ASTM D266; No. 15 asphalt saturated roofing felt at vertical surfaces. At horizontal surfaces use ice and water shield and vertically lap 4 inches minimum.

E. Metal Primer: Zinc chromate.

F. Protective Backing Paint: Zinc chromate alkyd.

G. Protective Back Coating: FS TT-C-494, bituminous.

H. Sealant: Type specified in Section 07900.

I. Plastic Cement: FS SS-C-153, Type I-asphaltic base cement.

J. Reglets: Surface mounted galvanized steel; Type SM; manufactured by Fry; field paint to match adjacent parapet wall flashing.

2.04 FABRICATION

A. Requirements shown by details are intended to establish basic dimension and profiles. Contractor shall be responsible for design of flashing and sheet metal assemblies and may make whatever modifications of and additions to details as may be required to

prevent water and air penetration. Maintain visual design concept as shown.

B. Comply with recommended flashing details of National Contractor's Association and Sheet Metal and Air Conditioning Contractor's National Association (SMACCNA) Manual.

C. Sheet Metal Flashing and Trim:
   1. Form section true to shape, accurate in size, square and free from distortion or defects.
   2. Fabricate cleats and starter strips of same material as sheet, minimum 6 inches wide, interlockable with sheet.
   3. Provide backing sheet at coping seam (except at corners) with 6" long, 22 ga. cleat matching profile of coping, and set coping in ribbons of 1/4" wide sealant.
   4. Form pieces in longest practical lengths.
   5. Hem exposed edges on underside 1/2 inch; miter and seam corners.
   6. Form material with standing lock seam.
   7. Fabricate corners from one piece with minimum 18 inch long legs seam for rigidity, seal with sealant.
   8. Fabricate vertical faces with bottom edge formed outward 1/4 inch and hemmed to form drip.

D. Scuppers, Gutters and Downspouts:
   1. Form scuppers, gutters and downspouts of profiles as shown on drawings, to SMACNA requirements
   2. Field measure site conditions prior to fabricating work.
   3. Fabricate with required connection pieces.
   4. Form sections square, true and accurate in size, in maximum possible lengths and free of distortion or defects detrimental to appearance or performance. Allow for expansion at joints.
   5. Hem exposed edges of metal.
   6. Fabricate scupper, gutter and downspouts accessories; seal watertight.

2.04 FINISH

A. Shop prepare and prime exposed ferrous metal surfaces.

B. Backpaint concealed metal surfaces with protective backing paint to minimum dry film thickness of 15 mils.

PART 3 EXECUTION

3.01 INSPECTION

A. Verify that surfaces are ready to receive work and conditions are as instructed by manufacturer.

B. Verify roof openings, curbs, pipes, sleeves, ducts, or vents through roof are solidly set, cant strips and reglets in place, and nailing strips located.

C. Verify membrane termination and base flashings are in place, sealed and secure.

D. Beginning of installation means acceptance of existing conditions.

3.02 PREPARATION

A. Field measure site conditions prior to fabricating work.

B. Install starter and edge strips, and cleats before starting installation.

C. Install surface mounted reglets true to lines and level. Seal top of reglets with sealant.

D. Cover wall surfaces with No. 15 asphalic roofing felt. Lap felt joints 3 inches minimum and turn up 6 inches minimum. Cover horizontal surfaces with ice and water shield. Turn up 6-inch minimum at abutting vertical surfaces.

E. Nail felt flashing at a 6 inch center on laps and edges.

3.03 INSTALLATION

A. Install sheet metal flashing, trim, downspouts, and accessories in accordance with Contract Documents, manufacturer's instructions, and applicable provisions of SMACNA Sheet Metal Manual.
   1. Conform to drawing details included in manual.

B. Sheet Metal Flashing and Trim:
   1. Insert flashings into reglets to form tight secure fit.
   2. Secure flashings in place using concealed fasteners. Use exposed fasteners only in locations approved by Architect.
   3. Seam and seal all joints.
   4. Apply plastic cement compound between metal flashings and felt flashings.
   5. Fit flashings tight in place. Make corners square, surfaces true and straight in planes, and lines accurate to profiles.
   6. Slope top of all parapet wall coping 1/4 inch per foot toward building interior.
   7. Seal metal joints watertight.

C. Scuppers, Gutters and Downspouts:
   1. Join lengths with formed seams sealed watertight. Flash and seal gutters to downspouts and accessories.
   2. Apply backing paint to metal back surfaces.
   3. Apply bituminous protective backing on surfaces in contact with dissimilar materials.
   4. Slope gutters 1/8 inch per foot minimum
   5. Seal metal joints watertight.
   6. Connect downspouts to storm sewer system. Seal connection watertight.
   7. Align downspouts with hubs. Where downspouts do not properly align, reset hubs to align properly at no extra cost to Owner.

D. Flat Seams: In compliance with SMACNA manual. Solder lap seams around roof scuppers.

E. Parapet Wall Coping Provide solid blocking to slope top of wall 1/4 inch per foot toward building. Install 6 inch wide back-up plates behind coping cross joints. Install sealant between back-up plate and coping panel. Form cross joints to comply with Plate 68 of the SMACNA manual. Lock front edge in continuous cleat. Miter, seam, and seal corners of coping.

F. Metal Base Flashing: Install galvanized base flashing where roof meets vertical surface without a cant strip.

G. Elastrometric Flashing: Install at locations indicated on drawings and a specified herein. Comply with manufacturer's printed instructions.

H. Felt Flashing: Install between roofing membrane and sheet metal parapet coping. Overlap joints 6 inches minimum.

3.04 CLEANING AND PROTECTION

A. Clean exposed surfaces of flashing of foreign materials and other substances which might cause corrosion.

B. Protect installed work. Work which does become damaged in any way is not watertight shall be repaired and/or replaced as directed to satisfaction of Architect and/or Owner at no additional cost or time.

3.05 SCHEDULE

A. Heavy Coated Steel (20 gauge) Parapet Wall: Coping, roof caps, and all exposed sheet metal other than leader boxes, downspouts, flashing and parapet coping.

B. Heavy Coated Steel (24 gauge): Wall metal flashing and roof counter flashing typical.

C. Pre-Coated Galvanized Steel (24 gauge): Downspouts, gutters and all non-exposed components. Pre-primed galvanized for field paint at exposed location.

END OF SECTION

SECTION 07722
ROOF HATCHES

PART 1 GENERAL

1.01 SUMMARY

A. Section Includes:
1. Prefabricated roof hatches, operable hardware, and counterflashings.

B. Related Sections:
1. Section 05515 - Roof access ladder.
2. Section 07510 - Built-Up Asphalt Bituminous Roofing: Roof system.
3. Section 07600 - Flashing and Sheet Metal: Flashing to roof system.
4. Section 09900 - Painting: Field painting.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. Acceptable Roof Hatch Manufacturers:
1. Bilco

B. Substitutions Not Allowed.

2.02 ROOF HATCH

A. Unit: 36 x 30 inch size, single leaf type, manual, operation open from ladder side.

B. Integral Steel Curb: 14 gage galvanized prime painted steel 12" high with 1 inch rigid glass fiber insulation; integral cap flashing to receive roof flashing and extended flange for mounting per manufacturer’s instructions.

C. Flush Steel Cover: Shock absorbing spring balanced lid; 14 gage galvanized prime painted steel; 1 inch glass fiber insulation; sandwiched by 22 gage steel interior liner; continuous neoprene gasket to provide weatherproof seal.

D. Hardware:
1. Compression spring operator and shock absorbers;
2. Steel manual pull handle for interior operation;
3. Steel hold open arm with vinyl covered grip handle for easy release,
4. Padlock Hasp: Heavy duty type.
5. Locks: Best 41B722 padlock with 3 sets of keys.
6. Weatherstrip: Neoprene seal.
7. Hinges: Manufacturer's recommended heavy duty type.

E. Hardware Finish: [Manufacturer's standard cadmium plated finish.] [Stainless steel finish throughout for installation in corrosive environment.]

F. Hatch Finish: Two coats rust inhibiting primer and two coats alkyd enamel.

2.03 FABRICATION

A. Fabricate components free of visual distortion or defects. Weld corners and joints.

B. Provide for removal of condensation occurring within components or assembly.

C. Fit components for weathertight assembly.

PART 3 EXECUTION

3.01 INSTALLATION

A. Coordinate with installation of roofing system and related flashings for weathertight installation.

B. Installation: Bolt hatch to roof deck through holes in flange of roof curb as recommended by the manufacturer. Support at roof as required.

C. Apply bituminous paint on surfaces of units in contact with cementitious materials or dissimilar metals.

END OF SECTION

SECTION 07900
SEALANTS

PART 1 GENERAL

1.01 SUMMARY

A. Section Includes:
1. Preparing sealant substrate surfaces.
2. Sealant and backing.

B. Related Sections:
1. Section 03300 - Cast-In-Place Concrete.
2 Section 07600 - Flashing and Sheet Metal.
2. Section 07240 - Exterior Insulation and Finish System
3. Section 08110 - Steel Doors and Frames.
4. Section 08800 - Glazing.
5. Section 09250 - Gypsum Board.

1.02 REFERENCES

A. American Society for Testing and Materials (ASTM):
1. ASTM D1056 - Flexible Cellular Materials - Sponge or Expanded Rubber.
2. ASTM D1565 - Flexible Cellular Materials - Vinyl Chloride Polymers and Copolymers (Open-Cell Foam).
3. ASTM C790 - Use of Latex Sealing Compounds.
4. ASTM C804 - Use of Solvent-Release Type Sealants.
5. ASTM C834 - Latex Sealing Compounds.
6. ASTM C920 - Sealants.

B. Federal Specifications (FS):
1. FS TT-S-00227 - Sealing Compound: Elastomeric Type, Multi-Component.
2. FS TT-S-00230 - Sealing Compound: Elastomeric Type, Single Component.
3. FS TT-S-001543 - Sealing Compound.

C. Sealing and Waterproofers Institute (SWI):
1. Sealant and Caulking Guide Specification.

1.03 SUBMITTALS

A. Submit under provisions of Section 01300.

B. Product Data:
1. Submit product data indicating sealant chemical characteristics, performance criteria, limitations and color availability.
2. Submit manufacturer's installation instructions.

1.04 QUALITY ASSURANCE

A. Manufacturer Qualifications: Company specializing in manufacturing products specified

in this Section with minimum three years documented experience.

B. Applicator Qualifications: Company specializing in applying work of this Section with minimum three years documented successful experience.

C. Conform to Sealant and Waterproofers Institute requirements for materials and installation.

D. Obtain elastomeric materials only from manufacturers who will, if required, send a qualified technical representative to project site for the purpose of advising the installer of proper procedures and precautions for use of the materials.

E. Installer shall use sealant which installer will guarantee for the installations shown, and shall request variations from these specified products, if required to meet performance conditions.

1.05 FIELD SAMPLES

A. Provide samples under provisions of Section 01300.

B. Construct field sample 6 feet long illustrating sealant type, color, and tooled surface.

C. Conduct pull tests per ASTM C 1521 and in the presence of the manufacturer's representative against all relevant substrate types in order to verify adhesion. Make sure that field samples are applied with and without priming in the event that primer is needed. Allow 14 days minimum cure time prior to conducting pull tests.

D. Accepted sample may remain as part of Work.

1.06 ENVIRONMENTAL REQUIREMENTS

A. Do not install solvent curing sealants in enclosed building spaces.

B. Maintain temperature and humidity recommended by sealant manufacturer during and after installation.

C. Do not proceed with installation of sealants under adverse weather conditions, or when temperatures are below or above manufacturer's recommended limitations for installation.

D. Proceed with the work only when forecasted weather conditions are favorable for proper cure and development of high early bond strength.

E. Wherever joint width is affected by ambient temperature variations, install elastomeric sealants only when temperatures are in the lower third of manufacturer's recommended installation temperature range so that sealant will not be subjected to excessive elongation and bond stress at subsequent low temperatures.

1.07 SEQUENCING AND SCHEDULING

A. Coordinate work under provisions of Section 01039.

B. Coordinate work of this Section with all Sections referencing this Section.

C. Pre-Installation Meeting:
   1. At the Contractor's direction, 14-21 days prior to installation, the installer, sealant manufacturer's technical representative, and other trades involved in coordination with sealant work meet with the Contractor at the project site to review the procedures and time schedule proposed for installation of sealants in coordination with other work.
   2. Review each major sealant application required on the project.

D. The installer must examine the joint surfaces, backing, and anchorage, and the conditions under which the sealant work is to be performed, and notify the Contractor of conditions detrimental to the proper and timely completion of the work and performance of the sealants.

E. Do not proceed with the sealant work until unsatisfactory conditions have been corrected in a manner acceptable to the installer. Commencing with installation of sealant materials constitutes acceptance of substrate conditions.

1.08 WARRANTY

A. Provide manufacturer’s warranty as listed below under provisions of Section 01700.

B. Warranty: Include coverage of installed sealants and accessories which fail to achieve air tight and watertight seal, exhibit loss of adhesion or cohesion, or do not cure.

PART 2 PRODUCTS

2.01 SEALANTS

A. Sealant (Type S-1): STPe (Silyl-Terminated Polyether) Sealant - ASTM C920 Class 25, Grade NS, Type M, FS TT-S-00227, Type II, Class A, single or multi-component, chemical curing, non-staining non-bleeding, capable of continuous water immersion, non-sag type; color as selected; Sonolastic 150 Tint-Base (multi-component) or Sonolastic 150 VLM (single-component) or approved equal. Warranty duration for this sealant type is ten (10) years.

B. Sealant (Type S-2): Self-Leveling Polyurethane Sealant: FS TT-S-00227, ASTM C920, Class A, Type II Two Component - self - leveling, multi component color as selected; THC 900 by Tremco or Sonolastic SL2 by Sonneborn. Warranty duration for this sealant type is five (5) years.

C. Sealant (Type S-3): Silicone or STPe (Silyl-Terminated Polyether) Sealant FS TT-S-01543, and FS TT-S-00230 a single component, low modulus, color as selected; Proglaze by Tremco, Dow Corning 795 or Sonneborn Sonolastic 150 VLM or approved equal. Warranty duration for this sealant type is ten (10) years.

D. Sealant (Type S-4): Acrylic Emulsion Latex: ASTM C834, single component; paintable, fast setting, white color; Acrylic Latex Caulk as manufactured by Tremco, AC 20 Acrylic

Latex by Pecora or Sonolac by Sonneborn. Warranty duration for this sealant type is ten (10) years.

E. Sealant (Type S-5): STPe (Silyl-Terminated Polyether) Sealant FS TTI-S-1543, Type S, class 25, grade NS, one component, mildew resistant. Warranty duration for this sealant type is ten (10) years.

2.02 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: Use non-gassing type Sof-Rod backer rod. Do not use either open-cell foam or standard closed cell foam backing materials

D. Bond Breaker: Pressure sensitive tape recommended by sealant manufacturer to suit application.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify that surfaces and joint openings are ready to receive work and field measurements are as shown on Drawings and recommended by manufacturer.

B. Beginning of installation means installer accepts existing surfaces and substrate.

3.02 PREPARATION

A. Clean and prime joints in accordance with manufacturer's instructions.

B. Remove loose materials and foreign matter which might impair adhesion of sealant.

C. Verify that joint backing and release tapes are compatible with sealant.

D. For elastomeric sealants, do not proceed with installation of sealant over joint surfaces which have been painted, lacquered, waterproofed or treated with water repellent or other treatment or coating unless a laboratory test for durability (adhesion), has successfully demonstrated that sealant bond is not impaired by coating or treatment. If laboratory test has not been performed or shows bond interference, remove coating or treatment from joint surfaces before installing sealant.

E. Etch concrete and masonry joint surfaces to remove excess alkalinity unless sealant manufacturer's printed instructions indicated that alkalinity does not interfere with sealant bond and performance. Etch with 5% solution of muriatic acid; neutralize with diluted ammonia solution, rinse thoroughly with water and allow to dry before sealant installation.

F. Roughen joint surfaces on vitreous coated and similar nonporous materials where sealant manufacturer's data indicated lower bond strength than for porous surfaces. Rub with fine abrasive to produce a dull sheen.

G. Perform preparation in accordance with:
   1. ASTM C804 for solvent release sealants.
   2. ASTM C790 for latex base sealants.

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

3.03 INSTALLATION

A. Perform installation in accordance with Contract Documents and following:
   1. ASTM C804 for solvent release sealants.
   2. ASTM C790 for latex base sealants.

B. Install sealant in accordance with Contract Documents and manufacturer's instructions.

C. Measure joint dimensions and size materials to achieve required width/depth ratios.

D. Install joint backing material to achieve minimum 25% compression of the backer rod diameter.

E. Prime joint surfaces based on results from Field Sample mock-ups and subsequent pull tests performed on same.

F. Install bond breaker tape in joints too shallow to accommodate backer rod.

G. Apply sealant within recommended application temperature ranges. Consult manufacturer when sealant cannot be applied with these temperature ranges

H. Install sealant free of air pockets, foreign embedded matter, ridges, and sags.

I. Employ only proven installation techniques which will ensure that sealants will be deposited in uniform continuous ribbons without gaps or air pockets, with complete joint bond surfaces equally on opposite sides.
   1. Except as otherwise indicated, tool sealant rabbet to a slightly concave surface, slightly below adjoining surfaces.
   2. Where horizontal joints are between a horizontal surface and a vertical surface, fill joint to form a slight cove so that joints will not trap moisture and dirt.
   3. Sand brick joints to match mortar.

J. Tool joints concave.

3.04 CLEANING AND REPAIRING

A. Clean work under provisions of Section 01700.

B. Clean adjacent soiled surfaces.

C. Spillage:

1. Do not allow sealants or compounds to overflow or spill onto adjoining surfaces, or to migrate into voids of adjoining surfaces including precast concrete panels and similar rough textures. Use masking tape or other precautionary devices to prevent staining of adjoining surfaces by either primer/sealer to the sealant/caulking compound.
2. Remove excess and spillage of compounds promptly as work progresses. Clean the adjoining surfaces by whatever means may be necessary to eliminate evidence of spillage without damaging substrate.

D. Repair or replace defaced or disfigured finishes caused by work of this Section.

3.05 TESTS FOR PERFORMANCE

A. After nominal cure of exterior joint sealants which are exposed to weather, test for water leaks. Flood joint exposure with water directed from a 3/4 inch garden hose held perpendicular to wall face 2'-0" from joint, connected to a water system with 30 psi minimum static water pressure at the nozzle. Move stream of water along joint at an approximate rate of 20 feet per minute.

B. Test approximately 5% of total joint system in locations which are typical of every joint condition, and which can be inspected easily for leakage on opposite face. Conduct test in presence of the General Contractor who will determine a actual percentage of joints to be tested and actual period of exposure to water from hose, based upon extent of observed leakage, or lack thereof. Repair sealant installation at leaks or, if leakage is excessive, replace sealant installation as directed.

C. Where nature of observed leakage indicates possibility of inadequate joints bond strength, General Contractor will direct additional testing be performed at a time when joints have been fully cured.

3.06 PROTECTION OF FINISHED WORK

A. Protect finished installation under provisions of Section 01500.

B. Protect sealants until cured.

3.07 SCHEDULE

A. Sealant (Type S-1): At exterior and interior non-traffic bearing joints where one or both joint surfaces are porous (such as concrete, masonry, etc.).

B. Sealant (Type S-2): At exterior and interior traffic bearing joints subject to foot or vehicular traffic, and exterior and interior exposed perimeter joints in slabs abutting walls or other vertical surfaces.

C. Sealant (Type S-3): At exterior storefront system.

D. Sealant (Type S-4): At interior miscellaneous non-traffic joints.

E. Sealant (Type S-5): At interior Toilet Rooms.

END OF SECTION

SECTION 08110
STEEL DOORS AND FRAMES

PART 1 GENERAL

1.01 SUMMARY

A. Section Includes:
   1. Interior hollow metal steel doors and frames.

B. Related Sections:
   1. Section 08117 - Prefinished Steel Door Frames
   2. Section 08710 - Door Hardware.
   3. Section 09900 - Painting: Field painting of doors and frames.

1.02 REFERENCES

A. Steel Door Institute (SDI):
   1. SDI-100 - Standard Steel Doors and Frames.

B. American Society for Testing and Materials (ASTM):
   1. ASTM A525 - Steel Sheet, Zinc-Coated (Galvanized) by the Hot-Dip Process.

1.03 QUALITY ASSURANCE

A. Conform to requirements of SDI-100.
   1. Maintain one copy of each document on site.

B. Manufacturer Qualifications: Company specializing in manufacturing Products specified in this section with minimum three years documented experience.

1.04 DELIVERY, STORAGE, AND HANDLING

A. Deliver products to site, store, protect, and handle under provisions of Section 01600.

B. Accept doors on site in manufacturer's packaging. Inspect for damage.

1.05 FIELD MEASUREMENTS

A. Verify that field measurements are as instructed by manufacturer.

1.06 COORDINATION

A. Coordinate work under provisions of Section 01039.

B. Coordinate work with door opening construction, door frame and door hardware installation.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. Acceptable Hollow Metal Door Manufacturers:
   1. Ceco Corp.
   2. Steelcraft Manufacturing Co.
   3. Curries.

B. Substitutions: Under provisions of Section 01600.

2.02 DOORS AND FRAMES

A. Interior Door Frames: Steel, 18 gauge
B. Interior Doors: Steel; 20 gauge
C. Exterior Door Frames: Steel; 16 gauge
D. Exterior Doors: Steel; 18 gauge

2.03 DOOR CONSTRUCTION

A. Face: Steel sheet in accordance with ANSI/SDI-100.

B. Core: Polyurethane or polystyrene foam.

C. Thermal Insulated Exerior Door: Total insulation value of R-5, measured in accordance with ASTM C236.

2.04 ACCESSORIES

A. Rubber Silencers: Resilient rubber.

B. Protective Coatings:
   1. Primer: Zinc chromate type.
   2. Bituminous Coating: Fibered asphalt emulsion.

2.05 FABRICATION

A. Fabricate doors and frames with hardware reinforcement welded in place.

B. Reinforce frames wider than 48 inches with roll formed steel channels fitted tightly into frame head, flush with top.

C. Prepare frame for silencers at interior door. Provide three single rubber silencers for single doors and mullions of double doors on strike side, and two single silencers on frame head at double doors without mullions.

D. Finish:
   1. Steel Sheet: Galvanized to ASTM A60.
   2. Primer: Air dried.
   3. Interior Frames: Factory finish polyester paint color as selected from manufacturers standard colors.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify substrate conditions under provisions of Section 01039.

B. Verify that opening sizes and tolerances are acceptable.

3.02 INSTALLATION

A. Install doors and frames in accordance with Contract Documents, and ANSI/SDI-100.

B. Coordinate with masonry wallboard wall construction for anchor placement.

C. Fill frames separating interior and exterior spaces with mineral wood insulation.

D. Coordinate installation of doors with installation of frames and hardware. Refer to Section 08710 for door hardware.

E. Touch-up primer and factory finished frames.

F. Erection Tolerances:

1. Maximum Diagonal Distortion: 1/16 inch measured with straight edge, corner to corner.

3.03 ADJUSTING

A. Adjust work under provisions of Section 01700.

B. Adjust door for smooth and balanced door movement.

END OF SECTION

SECTION 08410
ALUMINUM ENTRANCES AND STOREFRONTS

PART 1 GENERAL

1.01 SUMMARY

A. Section Includes:
1. Aluminum doors and frames.
2. Vision glass.
3. Door hardware.
4. Integral air and vapor barrier.
5. Perimeter sealant.

B. Related Sections:
1. Section 07900 - Sealants: System perimeter sealant and back-up materials.
2. Section 08800 - Glazing.

C. Products Installed but Not Furnished Under This Section:
1. Section 08710 - Door Hardware: Hardware items other than specified in this section.

1.02 REFERENCES

A. Architectural Aluminum Manufacturers' Association (AAMA):
1. AAMA - Metal Curtain Wall, Window, Store Front and Entrance - Guide Specifications Manual.
2. AAMA 606.1 - Specifications and Inspection Methods for Integral Color Anodic Finishes for Architectural Aluminum.
3. AAMA SFM-1 - Aluminum Storefront and Entrance Manual.

B. American National Standards Institute (ANSI):
1. ANSI A117.1 - Safety Standards for the Handicapped.

C. American Society for Testing and Materials (ASTM):
1. ASTM A386 - Zinc Coating (Hot Dip) on Assembled Steel Products.
2. ASTM B209 - Aluminum and Aluminum-Alloy Sheet and Plate.
3. ASTM B221 - Aluminum-Alloy Extruded Bar, Rod, Wire, Shape, and Tube.
4. ASTM E283 - Rate of Air Leakage Through Exterior Windows, Curtain Walls, and Doors.
5. ASTM E330 - Structural Performance of Exterior Windows, Curtain Walls, and Doors by Uniform Static Air Pressure Difference.
6. ASTM E331 - Test Method for Water Penetration of Exterior Windows, Curtain Walls, and Doors by Uniform Static Air Pressure Difference.

1.03 SYSTEM DESCRIPTION

A. Aluminum entrances and storefront system includes tubular aluminum sections, shop fabricated, factory pre-finished, vision glass, glass infill, related flashings, anchorage and attachment devices.

1.04 PERFORMANCE REQUIREMENTS

A. Design and size components to withstand dead and live loads caused by positive and negative wind pressure acting normal to plane of wall as calculated in accordance with applicable code and as measured in accordance with ASTM E330.

B. Limit mullion deflection to 1/200; with full recovery of glazing materials.

C. System shall accommodate, without damage to components or deterioration of seals, movement within system, movement between system and peripheral construction, dynamic loading and release of loads, deflection of structural support framing.

D. Limit air leakage through assembly to 0.06 cfm/min/sq ft of wall area, measured at reference differential pressure across assembly of 1.57 psf as measured in accordance with ASTM E283.

E. Water Leakage: None, when measured in accordance with ASTM E331 with test pressure difference of 2.86 lbs/sq ft.

F. Maintain continuous air and vapor barrier throughout assembly, primarily in line with inside pane of glass and heel bead of glazing compound.

G. System shall provide for expansion and contraction within system components caused by cycling temperature range of 170 degrees F over 12 hour period without causing detrimental affect to system components.

H. Drain water entering joints, condensation occurring in glazing channels, or migrating moisture occurring within system, to exterior by weep drainage network.

1.05 SUBMITTALS

A. Submit under provisions of Section 01300.

B. Shop Drawings: Indicate system dimensions, framed opening requirements and tolerances, affected related work and expansion and contraction joint location and details.

C. Manufacturer's Certificate: Certify that products meet or exceed specified requirements.

1.06 QUALITY ASSURANCE

A. Perform Work in accordance with AAMA SFM-1 Guide Specifications Manual.

B. Conform to requirements of ANSI A117.1.

1.07 QUALIFICATIONS

A. Manufacturer and Installer: Company specializing in manufacturing aluminum glazing systems with minimum three years documented experience.

1.08 DELIVERY, STORAGE, AND HANDLING

A. Deliver products to site, store, protect, and handle under provisions of Section 01600.

B. Protect pre-finished aluminum surfaces with wrapping. Do not use adhesive papers or sprayed coatings which bond when exposed to sunlight or weather.

1.09 ENVIRONMENTAL REQUIREMENTS

A. Do not install sealants when ambient temperature is less than 40 degrees F during and 48 hours after installation.

1.10 FIELD MEASUREMENTS

A. Verify that field measurements are as indicated on shop drawings.

1.11 COORDINATION

A. Coordinate Work under provisions of Section 01039.

1.12 WARRANTY

A. Provide one year warranty under provisions of Section 01700.

B. Warranty: Include coverage for complete system for failure to meet specified requirements.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. Acceptable Manufacturers:
1. U.S. Aluminum.
2. Kawneer Company, Inc.

B. Substitutions are not allowed.

2.02 MATERIALS

A. Extruded Aluminum: ASTM B221; 6063 alloy, T5 temper.

B. Sheet Aluminum: ASTM B209; 6063 alloy, T5 temper.

C. Fasteners: Galvanized steel.

2.03 COMPONENTS

A. Frame: 2 x 4½ inch nominal dimension; applied glazing stops; drainage holes; internal weep drainage system, compensating head channel J.C. 460 and sub sill A.F.100 flashing system.

B. Doors: 1 3/4 inches thick, narrow style, 2-1/8 inch wide top rail, 2 inch wide vertical stiles, 10 inch wide bottom rail; square glazing stops.

C. Flashings: .080 inch thick aluminum finish to match mullion sections where exposed.

2.04 GLASS AND GLAZING MATERIALS

A. Glass and Glazing Materials: As specified in Section 08800 of Types described below:
1. Glass in Exterior Lights: Type SG-A and SG-B.
2. Glass in Door Lights: Type FG-B.

2.05 SEALANT MATERIALS

A. Sealant and Backing Materials: As specified in Section 07900 of types described below:
1. Perimeter Sealant: Silicone sealant.

2.06 HARDWARE

A. Weather Stripping: Nylon pile, continuous and replaceable.

B. Door Bottom Sweep: Surface applied weatherstrip BW 200.

C. Threshold: Extruded aluminum, one piece per door opening, ribbed surface meeting ANSI A117.1 requirements, U.S. Aluminum TH 400.

D. Pivots: Offset type.

E. Push/Pull: U.S. Aluminum PS001 and PS002 style.

F. Closer: Overhead, 90° concealed type with holdo pen.

G. Deadlatch: Adams-Rite Model MS1850-A at single doors.
Adams-Rite Model MS4085-A 3 pt. at double doors.

H. Cylinder Lock: Refer to Section 08710 for cylinder.

I. Signage: Applied sign stating "This door shall remain unlocked during business hours" as required by local jurisdictional official.

J. Stops: Manufacturer’s standard.

2.07 FABRICATION

A. Fabricate components with minimum clearances and shim spacing around perimeter of assembly, yet enabling installation and dynamic movement of perimeter seal.

B. Accurately fit and secure joints and corners. Make joints flush, hairline, and weatherproof.

C. Prepare components to receive anchor devices. Fabricate anchors.

D. Arrange fasteners and attachments to conceal from view.

E. Prepare components with internal reinforcement for door hardware and door operator hinge hardware.

F. Reinforce framing members for imposed loads.

2.08 FINISHES

A. Finish coatings to conform to AAMA 606.1.

B. Exterior and Interior exposed Aluminum Surfaces: AAMA A44, Class 1 finish, anodized prepared with mechanical M 12, chemical C 22 pre-treatment, Clear aluminum anodized.

C. Concealed Steel Items: Galvanized in accordance with ASTM A386 to 2.0 oz/sq ft.

D. Apply one coat of bituminous paint to concealed aluminum and steel surfaces in contact with cementitious or dissimilar materials.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify site opening conditions under provisions of Section 01039.

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.

3.02 INSTALLATION

A. Install wall system in accordance with Contract Documents, reviewed Shop Drawings, manufacturer's instructions and AAMA - Metal Curtain Wall, Window, Store Front and Entrance - Guide Specifications Manual.

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.

E. Provide thermal isolation where components penetrate or disrupt building insulation.

F. Coordinate attachment and seal of perimeter air and vapor barrier materials.

G. Pack fibrous insulation in shim spaces at perimeter of assembly to maintain continuity of thermal barrier.

H. Install flashings and column covers as required.

I. Set thresholds in bed of mastic and secure.

J. Install hardware using templates provided.

K. Install glass in accordance with Section 08800, to glazing method required to achieve performance criteria.

L. Install perimeter sealant to method required to achieve performance criteria in criteria in accordance with Section 07900.

3.03 TOLERANCES

A. Maximum Variation from Plumb: 0.06 inches every 3 ft non-cumulative or 1/16 inches per 10 ft, whichever is less.

B. Maximum Misalignment of Two Adjoining Members Abutting in Plane: 1/32 inch.

3.04 ADJUSTING

A. Adjust work under provisions of Section 01700.

B. Adjust operating hardware for smooth operation.

3.05 CLEANING

A. Clean work under provisions of 01700.

B. Remove protective material from pre-finished aluminum surfaces.

C. Wash down surfaces with a solution of mild detergent in warm water, applied with soft, clean wiping cloths. Take care to remove dirt from corners. Wipe surfaces clean.

D. Remove excess sealant by method acceptable to sealant manufacturer.

3.06 PROTECTION OF FINISHED WORK

A. Protect finished Work under provisions of Section 01500.

B. Protect finished Work from damage.

END OF SECTION

SECTION 08460
AUTOMATIC SLIDING DOORS

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Automatic sliding doors with operator and motion/presence sensor control device.

1.2 RELATED SECTIONS

A. Section 08410 - Aluminum Entrances and Storefronts
B. Section 08700 - Hardware
C. Section 08800 - Glazing
D. Section 16000 - Electrical

1.3 REFERENCES

A. ANSI Z97.1 - Safety Glazing Material Used in Buildings
B. ANSI/BHMA 156.10 - Power Operated Pedestrian Doors
C. ANSI/UL 325 - Door, Drapery, Gate, Louver, and Window Operators and Systems

1.4 SYSTEM DESCRIPTION

A. Doors Powered to Open Position:
   1. Doors powered by DC electric motor and mechanical gear assembly transmitted to active leaves by fiberglass-reinforced tooth drive belt for silent operation. Doors using roller chain, cable, or hydraulic devices shall not be accepted.
   2. Power door to open position by signals received by microprocessor from the actuation controls.
   3. The last portion of the opening cycle shall be controlled by a microprocessor generated signal that electronically reduces voltage to motor until door is fully open. Door systems that use microswitches shall not be accepted.
   4. To permit safe passage if an obstruction is detected between opening doors and surrounding walls or interior fittings, the doors shall immediately stop and after a delay go to the full closed position. Door systems that only monitor the door travel while closing shall not be acceptable.

B. Doors Powered to Closed Position:
   1. The active leafs will only be powered to closed position when all actuating devices are cleared and after remaining in the open position for a preset time delay (per ANSI standards).
   2. The last portion of the closing cycle shall be controlled by a microprocessor generated signal that electronically reduces voltage to the motor until door is fully closed.
   3. To permit safe passage between closing doors, the doors immediately reverse to open position if an obstruction is detected, then resume their interrupted movement at low speed to check whether the obstruction has disappeared or not. Door systems that only monitor the door travel while opening shall not be acceptable.

C. Emergency Breakaway:
   1. Full Breakout System: Interior sliding active leaves and sidelites swing out from any position in sliding mode.
   2. Fixed Sidelite System: Exterior sliding active leaves swing out from any position in sliding mode.
   3. Breakaway Pressure: Field adjustable to building code requirements and in accordance with ANSI/BHMA 156.10 maximum of 50 pounds.

D. Watchdog Monitoring:
   1. Microprocessor Software: Constantly monitor drive train system operations.
   2. Watchdog Control Circuit: Assume command of system and shut down automatic function by holding doors open, should door speed, motor function, or drive train operations deviate from design criteria ranges.
   3. Secondary Supervisory Circuit: Monitor main Watchdog control circuit every 255 door cycles, ready to perform as a backup.

E. Energy Saving Device:
   1. Switch: Recessed in interior header cover.
   2. Door Opening Settings: Off, exit only, 2-way traffic, partial opening, and hold fully open.
   3. Partial Opening Mode: Switch reduces total door opening to reduce conditioned air loss.
      A. Microprocessor Programmed Intelligence: Door opening automatically resumes full-open position whenever traffic flow exceeds preset volumes.
      B. Door returns to reduced opening mode when traffic subsides.
   4. Heavy Weather Pile: Between doors and sidelites and between emergency breakaway hardware and door stiles.

1.5 PERFORMANCE REQUIREMENTS

A. General: Provide doors that have been designed and fabricated to comply with specified performance requirements, as demonstrated by testing manufacturer's corresponding standard systems.
B. Compliance:
   1. ANSI/BHMA 156.10.
   2. ANSI/UL 325 listed.
   3. Air Infiltration per ASTM E283-91 – Standard Test Method for Determining the Rate of Air Leakage Through Exterior Windows, Curtain Walls, and Doors Under Specified Pressure Differences Across Specimen.
   a. Fixed sidelite: static pressure air infiltration conducted at 0.57 psf (15 mph) with a 0.6 cfm/ft^2 result and 1.57 psf (25 mph) with a 1.1 cfm/ft^2 result.
   b. Full breakout: static pressure air infiltration conducted at 0.57 psf (15 mph) with a .07 cfm/ft^2 result and 1.57 psf (25 mph) with a 1.3 cfm/ft^2 result.
   4. Structural Performance (wind load) per ASTM E330-07 – Standard Test Method for Structural Performance of Exterior Windows, Curtain Walls, Doors by Uniform Static Air Pressure Difference. Testing conducted at positive and negative loads.
   a. Fixed sidelite: 50 psf (150 mph)
   b. Full breakout: 37 psf (120 mph)
   5. Forced Entry Resistance per AAMA 1303.5 – Voluntary Specifications for Forced Entry Resistant Aluminum Sliding Glass Doors.
C. Automatic door equipment accommodates medium to heavy pedestrian traffic.
D. Automatic door equipment accommodates up to following weights for active leaf doors:
   1. Bi-Part Doors: 220 pounds (100 kg) per active leaf.
   2. Single Slide Doors: 440 pounds (200 kg) per active leaf.
E. Operating Temperature Range: -35 degrees F to 131 degrees F (-30 degrees C to 55 degrees C).
F. Motion and Presence Detection System: Uses planar K-band microwave technology to detect motion and focused active infrared technology to detect presence, in a single housing.
G. Systems With Transom Over 16'-0" (4,877 mm) or With Heavy Glass: System can span up to 16 feet without overhead support. Systems at 16'-0", with transoms, or with heavy glass shall install anti-sag rods through transom verticals.

1.6 SUBMITTALS

A. Comply with Section 01330 - Submittal Procedures.
B. Product Data: Submit manufacturer's product data, including description of materials,

components, fabrication, finishes, and installation.

C. Shop Drawings: Submit manufacturer's shop drawings, including elevations, sections, and details, indicating dimensions, materials, and fabrication of doors, frames, sidelites, operator, motion/presence sensor control device, anchors, hardware, finish, options, and accessories.
D. Samples: Submit manufacturer's samples of aluminum finishes.
E. Test Reports: Submit certified test reports from UL, CUL, and ICBO indicating doors comply with specified performance requirements.
F. Manufacturer's Project References: Submit list of successfully completed projects including project name and location, name of architect, and type and quantity of doors manufactured.
G. Manufacturer's Field Reports: Submit manufacturer's field reports from AAADM certified technician of inspection and approval of doors for compliance with ANSI/BHMA 156.10 after completion of installation.
H. Operation and Maintenance Manual:
    1. Submit manufacturer's operation and maintenance manual.
    2. Include spare parts list.
I. Warranty: Manufacturer's standard warranty shall be one year from date of installation.

1.7 QUALITY ASSURANCE

A. Manufacturer's Qualifications:
    1. Continuously engaged in manufacturing of doors of similar type to that specified, with a minimum of 10 years successful experience.
    2. Member: American Association of Automatic Door Manufacturers (AAADM).
    3. Door, frame, operator, and sensor components from same manufacturer.
B. Installer's Qualifications:
    1. Minimum of 2 years successful experience in installation of similar doors.
    2. Local certified Besam distributor.
    4. 3. Approved by manufacturer.

1.8 DELIVERY, STORAGE, AND HANDLING

A. Delivery: Deliver materials to site protected from damage.
B. Storage: Store materials in clean, dry area indoors in accordance with manufacturer's instructions.
C. Handling: Protect materials and finish from damage during handling and installation.

1.9 MAINTENANCE SERVICE

A. Manufacturer shall provide factory-owned central-dispatch system for maintenance service.
B. The manufacturer shall maintain a company owned dispatch system that shall be available 24 hours per day, 365 days per year to insure proper service capability.
C. A manufacturer's employee, not an answering service, shall obtain malfunction information and dispatch appropriate service agency to project location.
D. Toll free phone number, 1-877-BESAM-US (1-877-237-2687), shall be prominently displayed on header of each operator.
E. Outside contractors or answering services are not acceptable.

PART 2 PRODUCTS

2.1 MANUFACTURER

A. Besam Entrance Solutions, 1900 Airport Road, Monroe, North Carolina 28110. Toll Free (866) BESAM-US. Phone (704)290-5551. Fax (704)290-5555. Web Site www.besam.com. E-Mail marketing@besam-usa.com.

2.2 AUTOMATIC SLIDING DOORS

A. Model: Unislide automatic sliding doors.
   1. Aluminum doors and frames with sidelite and active door leaves.
   2. Overhead-concealed, electro-mechanical, microprocessor-controlled, sliding door operator.
   3. Operator housing, floor rollers, and door carriers.

B. Dimensions: As indicated on the drawings

2.3 ALUMINUM DOORS AND FRAMES

A. Doors and Frames: Extruded aluminum, Alloy 6063-T5.
   1. Hydraulic dampers (optional): provide 90 degree stop and cushion door upon opening and closing during emergency breakout conditions.

B. Glass:
   1. Glazing Material: ANSI Z97.1.
   2. Active Leaves: 1/4-inch tempered glass.
   3. Sidelites: 1/4-inch tempered glass.
   4. Field-glazed or preglazed.

C. Door Carriers:
   1. Roller Wheels: 2 steel roller wheels, 1-3/4-inch diameter, per active door leaf for operation over replaceable Delrin track. Single journal with sealed oil-impregnated bearings.
   2. 2 self-aligning anti-risers per leaf.

D. Vertical Jambs: 1-3/4 inches by 4-1/2 inches

E. Header:
   1. Span: Maximum 16'-0" without intermediate supports when using 1/4-inch glass.
   2. Size: 7-3/4 inches wide by 6-7/8 inches high.
   3. Hinge Point: Allows access for adjustments.
   4. Design: Closed header.

F. Stiles: 4 inches wide.

G. Pivots: Top and bottom concealed pivots, extruded aluminum.

H. Hardware: Breakaway.

I. Exterior Glazing Stop Extrusion: Nonremovable, security-type glazing bead to prevent unauthorized entry.

2.4 SLIDING DOOR OPERATOR

A. Operator:
   1. Overhead-concealed or surface-applied, electro-mechanical, microprocessor-controlled.
   2. Motor: High-efficiency, energy-efficient, DC motor.
   3. Mechanical drive assembly.
   4. Microprocessor System: Sets opening and closing speeds based on factory-adjusted configuration settings.
   5. Mechanical Limit Switches: Not acceptable.
   6. Adjustable Hold Open Time Delay: 0 to 60 seconds.
   7. Software: Incorporates self-diagnosing system.

2.5 AIR INFILTRATION

Weatherstripping: All active door panel weatherstripping shall be concealed, “finned-pile.”

2.6 STRUCTURAL PERFORMANCE (WIND LOAD COMPLIANCE) AND FORCED ENTRY RESISTANCE

A. Locking shall be independent 2 pt- locking system in each active leaf and include exterior key

cylinder and interior thumb turn.

B. Threshold shall be aluminum, ½" x 4-1/2" running full width of package. Lead-up: optional.

2.7 MOTION AND PRESENCE SENSOR CONTROL DEVICE

A. Model: The BEA Wizard Sliding Door Sensing System
   1. Uses planar K-band microwave technology to detect motion and focused active infrared technology to detect presence, in a single housing. The focused active infrared presence technology overlaps the motion pattern.
   2. The active infrared is comprised of 96 spots of detection made out of four rows of 24 spots of detection each (two rows on each side of the door). The focused presence technology never shuts off during closing cycle of the door.VThe Wizard Vis self-monitoring (motion and presence sensor) and has the capability to make adjustments with a universal remote control.The self-monitored Wizard communicates with the Unislide through a monitoring connection. The self-monitoring connection allows the door to go into a failsafe mode in the event of a sensor failure.
   3. Operating temperature range of -30^{o} F to 131^{o} F.
   4. Switches and Sensor: Field installed and adjusted.

2.8 ELECTRICAL

A. High-Efficiency DC Motor: Maximum of 3 A current draw. Allow for 5 operators to run on one 20 A line.
B. Power: Self-detecting line voltage capable control. 120 V through 240V, 50/60 Hz, 3 A incoming power with solid-earth ground connection for each door system. 5 door systems on one 20 A circuit.
C. Wiring: Separate channel raceway free from moving parts.
D. Brown out/high voltage capability: System has capability to operate at full performance well beyond brown out and high line voltage conditions (85V – 265V) sensing changes and adjusting automatically.
E. Convenience Battery: Shall be concealed in header and capable of full operation with blackout conditions, including sensor capabilities for typically 100 cycles.

2.9 ALUMINUM FINISHES

A. Anodized: Clear aluminum finish, AA-C22A31

PART 3 EXECUTION

3.1 EXAMINATION

A. Examine and measure areas to receive doors. Notify Architect of conditions that would adversely affect installation or subsequent utilization of doors. Do not proceed with installation until unsatisfactory conditions are corrected.

3.2 PREPARATION

A. Ensure openings to receive frames are plumb, level, square, and in tolerance.
B. Ensure proper support has been provided at operator header.
C. Ensure floor is level and smooth.

3.3 INSTALLATION

A. Install doors in accordance with manufacturer's instructions and ANSI/BHMA 156.10.
B. Install doors and beam plumb, level, square, true to line, and without warp or rack.

C. Anchor frames securely in place.
D. Separate aluminum from other metal surfaces with bituminous coatings or other means approved by Architect.
E. Install exterior doors to be weathertight in closed position.
F. Repair minor damages to finish in accordance with manufacturer's instructions and as approved by Architect.
G. Remove and replace damaged components that cannot be successfully repaired as determined by Architect.

3.4 FIELD QUALITY CONTROL

A. Manufacturer's Field Services:
   1. Manufacturer's representative shall provide technical assistance and guidance for installation of doors.
   2. Before placing doors in operation, AAADM certified technician shall inspect and approve doors for compliance with ANSI/BHMA 156.10. Certified technician shall be approved by manufacturer.

3.5 ADJUSTING

A. Adjust doors for proper operation in accordance with manufacturer's instructions and ANSI/BHMA 156.10.

3.6 CLEANING

A. Clean doors promptly after installation in accordance with manufacturer's instructions.
B. Do not use harsh cleaning materials or methods that would damage glass or finish.

3.7 PROTECTION

A. Protect installed doors and finish to ensure that, except for normal weathering, doors and finish will be without damage or deterioration at time of substantial completion.

END OF SECTION

SECTION 08710
DOOR HARDWARE

PART 1 GENERAL

1.01 SUMMARY

A. Section Includes:
1. Architectural and door hardware not specifically supplied as part of door assemblies or manufactured items.

B. Related Sections:
1. Section 08110 - Steel Doors and Frames.
2. Section 10441 - Address Signs.

C. Products Furnished but Not Installed Under This Section:
1. Furnish templates to Section 08110 and 08110 for door and frame preparation.

1.02 REFERENCES

A. American National Standards Institute/National Fire Protection Institute (ANSI/NFPA):
1. ANSI A117.1 - Specifications for Making Buildings and Facilities Accessible to and Usable by Physically Handicapped People.
2. ANSI/NFPA 80 - Fire Doors and Windows.
3. NFPA 101 - Life Safety Code.

B. Architectural Woodwork Institute (AWI).
1. AWI Quality Standards Guide Specifications and Quality certification Program.

C. Builders Hardware Manufacturers Association (BHMA).

D. Door and Hardware Institute (DHI).

E. Steel Door Institute (SDI).

1.03 SUBMITTALS

A. Submit under provisions of Section 01300.

B. Hardware Schedule: Submit six (6) copies of the final hardware schedule in the manner and format specified, complying with the actual construction progress schedule requirements (for each draft). Hardware schedules are intended for coordination of the work. Review and acceptance by the architect or Owner does not relieve the Contractor of responsibility for errors or omissions and of his exclusive responsibility to fulfill the requirements as shown and specified. Three (3) corrected copies shall be returned to the Architect.

1. Format of Schedule: The following is an example of the required format only of the final hardware schedule:

Hardware Set 'A'

Door No. 101

Butt Hinges	FBB170	US26D 5x42
Lock Set	D70PD-Orbit	26D
Closer	LCN-4114	Al
Kickplate	5024 10x34	479 Beige
Bumper	407B	US26D
Silencers	21	

2. Hardware schedules prepared in the horizontal manner are not acceptable. Doors listed for the same hardware, but of different sizes shall be listed under separate headings.

C. Operation and Maintenance Data:
1. Submit operation and maintenance data under provisions of Section 01700.
2. Include data on operating hardware, lubrication requirements, inspection procedures related to preventative maintenance, and maintenance requirements for exposed finishes.

1.04 QUALITY ASSURANCE

A. Coordination: Coordinate work of this Section with other directly affected Sections involving manufacturer of any internal reinforcement for door hardware.

B. Manufacturer's Qualifications: Companies specializing in manufacturing door hardware with minimum three years documented experience.

C. Hardware Supplier Qualifications: Company specializing in supplying commercial door hardware with minimum three years documented experience, and an authorized factory direct distributor.

D. Regulatory Requirements:
1. Conform to applicable code for requirements applicable to fire rated doors and frames.
2. Conform to applicable sections of Chapter 5 of NFPA 101.
3. Comply with all requirements of the "Americans with Disabilities Act".

E. Keying Requirements:
1. Assist Owner in setting keying schedule.
2. Make modifications to keying schedule as required by Owner without cost to Owner.
3. Secure Owner's written approval of final keying schedule prior to ordering locking items.

1.05 DELIVERY, STORAGE, AND HANDLING

A. Deliver products to Site, store and protect under provisions of Section 01600.

B. Package hardware items individually; label and identify package with door opening code to match hardware schedule. Include necessary screws, keys instructions and installation templates.

C. Deliver keys to Owner by security shipment direct from hardware supplier.

D. Protect hardware from loss or damage throughout construction period:
   1. Catalog and store in secure area.
   2. Replace all missing or damaged items with no additional cost to Owner.
   3. Leave installed hardware clean and in proper operating condition, maintaining all key identification tags in place, clean and legible.

1.06 PROJECT CONDITIONS:

A. Furnish hardware of proper design for use on doors and frames of thickness, profile, swing, security and similar requirements indicated, as necessary for proper installation and function.

B. Templates:
   1. Furnish hardware templates to each fabricator of doors, frames and other work scheduled to be factory prepared for installation of hardware.
   2. Check Shop Drawings of such other work to confirm adequate provisions for proper installation of hardware.

1.07 WARRANTY

A. Provide one year warranty under provisions of Section 01700.

B. Warranty: Provide five year coverage of door closers.

C. Provide adjustment for 1 year of door hardware and closers.

1.08 MAINTENANCE MATERIALS

A. Provide special wrenches and tools applicable to each different or special hardware component.

B. Provide maintenance tools and accessories supplied by hardware component manufacturer.

PART 2 PRODUCTS

2.01 MATERIALS

A. Acceptable Manufacturers: As noted within the hardware schedule.

B. Substitutions: Not Allowed.

C. Fasteners:
   1. Provide all necessary screws, bolts, anchors or other devices of suitable size and type to securely anchor hardware in position.
   2. Exposed fasteners shall harmonize with hardware material and finish. Notify Architect of any mismatch of finish prior to installation.
   3. Provide phillips head counter sunk fasteners for all expose locations. Furnish hardware with approved anchors for intended application according to hardware manufacturer's recommendations.

D. Fire Classification: Where doors carry UL Label for fire classification, all hardware applied to that door shall comply with that classification.

2.02 LOCKSETS AND CYLINDERS:

A. All locksets to be 2 3/4" backset.

B. All locks to have removable cores.

2.03 KEYING

A. Door Locks: Master keyed, Grand master keyed, Great grand master keyed, including construction keying.

B. Supply 3 keys for each lock.

C. Supply keys in following quantities:
1. 6 master keys.
2. 6 grand master keys.
3. 6 great grand master keys.
4. 10 construction keys.

2.04 HARDWARE FINISHES

A. Exposed finishes shall be Satin Chrome / Aluminum except as otherwise noted in schedule at the end of this Section.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify that doors and frames are ready to receive work and dimensions are as indicated on Shop Drawings.

B. Beginning of installation means acceptance of existing conditions.

3.02 INSTALLATION

A. Install hardware in accordance with manufacturer's instructions and regulatory requirements.

B. Use templates provided by hardware item manufacturer.

C. Mounting heights for hardware from finished floor to center line of hardware item:
1. Locksets: 40 inches.

*All other hardware shall be installed as recommended by manufacturer.

D. Conform to ANSI A117.1 for positioning requirements for handicapped.

3.03 ADJUST AND CLEAN

A. Initial Installation:

1. Adjust and check each operating item of hardware and each door, to verify proper operation and function of all units.
2. Lubricate moving parts as recommended by manufacturer.
3. Replace, at no extra cost, units which cannot be adjusted and lubricated to operate freely and smoothly as intended for application.

B. Final Adjustment:
1. When hardware installation occurs more than one month prior to acceptance or occupancy of space or area, make final check and adjustment of hardware items one week prior to acceptance or occupancy.
2. Clean and relubricate operating items as necessary to restore function and finish of hardware and doors.
3. Adjust door control devices to compensate for final operation of heating and ventilating equipment.

C. Instructions: Instruct Owner's personnel in proper adjustment and maintenance of hardware and hardware finishes, during final acceptance of hardware.

3.04 SCHEDULE

A. Furnish the hardware indicated on the Door Schedule as shown on the Drawings, or as required to complete the facility.

Hardware Set 'A'

Armored Strike	MS+4002	Adams Rite
Hookbolt Latch/Lock	MS+1890	Adams Rite
Temporary Cylinder	4036	Adams Rite
Mortise Turn Knob Cylinder on interior side	4066	Adams Rite
Mortise Cylinder with interchangeable core on exterior side	80-133	Schlage
Saddle Threshold		Besam
Interchangable Store Core	80-037	Schlage
Adhesive Sign (1” black letters) “*This Door To Remain Unlocked When The Building Is Occupied*”	7741BC	Trimco/BBW

Hardware Set 'B'

Butt Hinges	FBB 191	Stanley
Closer	4040H-CUSH	LCN
Lever Latch	S70PD SAT	Schlage
Wall Stop	WS402CCV	Ives
Silencers	SR66	Ives

Hardware Set 'C'

Butt Hinges	FBB 191	Stanley
Closer	4040H-CUSH	LCN
Lever Latch	S10D SAT	Schlage
Wall Stop	WS402CCV	Ives
Silencers	SR66	Ives

Hardware Set 'D'

Butt Hinges	FBB 179	Stanley
Push Plate / Pull Handle	Stainless Steel	
Wall Stop	WS402CCV	Ives
Silencers	SR66	Ives
Kickplate (both sides)	stainless steel	

Hardware Set 'E'

Butt Hinges	FBB 191 NRP	Stanley
Closer	4040H-CUSH	LCN
Exit Device	2670	VonDuprin
Weatherstrip	S88C	Pemko
Door Bottom	315CN	Pemko
Kickplate (both sides)	stainless steel	
Rain drip flashing		
Door coordinator at double door		
Astragal Seal at double door		
Kick down (interior side)		
Wide angle door scope	D175; chrome	Door Scope

Hardware Set 'E.1"

Same as "E"		
Lever at Load Out door only	S80D SAT (exterior only)	Schlage

Hardware Set 'F

Butt Hinges	FBB 179	Stanley
Lever Latch	S80D SAT	Schlage
Wall Stop	WS402CCV	Ives
Silencers	SR66	Ives

Hardware Set 'G'

Butt Hinges	FBB 179	Stanley
Wall Stop	WS402CCV	Ives
Silencers	SR66	Ives

ADA Compliant single function "Occupied" indictor door lock

END OF SECTION

SECTION 08800
GLAZING

PART 1 GENERAL

1.01 SUMMARY

A. Section Includes:
1. Glass and glazing for Sections referencing this Section for products and installation.

B. Related Sections:
1. Section 07900 - Sealants.
2. Section 08110 - Steel Doors and Frames

1.02 REFERENCES

A. American Society for Testing and Materials (ASTM):
1. ASTM E330 - Structural Performance of Exterior Windows, Curtain Walls, and Doors by Uniform Static Air Pressure Difference.
2. ANSI Z97.1 - Safety Performance Specifications and Methods of Test for Safety Glazing Used in Buildings.

B. Consumer Products Safety Commission (CPSC):
1. CPSC - Safety Standard for Architectural Glazing Materials - 16 CFR 1201.

C. Flat Glass Marketing Association (FGMA):
1. FGMA - Glazing and Sealant Manual.

D. Sealed Insulated Glass Manufacturers Association (SIGMA):
1. SIGMA Manual

1.03 PERFORMANCE REQUIREMENTS

A. Glass and glazing materials of this Section shall provide continuity of building enclosure vapor and air barrier:
1. In conjunction with materials described in Section 07900 and 08410.
2. Maintain continuous air and vapor barrier throughout glazed assembly from glass pane to heel bead of glazing sealant.

B. Size glass to withstand dead loads and positive and negative live loads acting normal to plane of glass as calculated in accordance with applicable code acting inwardly or outwardly without exceeding deflection limits.

C. Limit glass deflection to 1/200 or flexure limit of glass with full recovery of glazing materials, whichever is less.

D. Thermal Movement: Provide thermal expansion and contraction movement capability, resulting from minimum ambient temperature range through 120 degrees F which may cause curtain wall material temperature range through 180 degrees F.

E. Condensation: Prevent excessive condensation of interior faces of work when heating and ventilation system is in operation under the following conditions:
   1. Outdoor ambient temperature: 0 degrees F and 15 mph wind.
   2. Indoor ambient temperature: 75 degrees F at 25% relative humidity.
   3. Excessive condensation is defined as visible water, ice, fog, or frost on more than 10% of any entrance storefront or curtain wall module, or accumulation or uncontrolled flow of water from condensation on such module at any location.

F. Labels:
   1. Label each piece of glass with manufacturer's label identifying kind and quality of glass.
   2. Paper, or other removable type labels, affixed to any inaccessible surface of insulating glass units are unacceptable.
   3. Permanently label each piece of safety glazing in accordance with requirements of regulatory agencies having jurisdiction.

1.04 QUALITY ASSURANCE

A. Perform Work in accordance with FGMA Glazing Manual and Manufacturer's recommendations for glazing installation methods.

1.05 DELIVERY, STORAGE, AND HANDLING

A. Material Delivery and Storage:
   1. Deliver materials in manufacturer's original unopened packaging with protective interleaves between lights.
   2. Store materials with interleaving and labels intact, in cool, clean, dry area where temperatures are above dew point.
   3. Protect from weather with tarpaulin or ventilated plastic coverings.

B. Material Handling:
   1. Handle to avoid damage to glass surfaces, avoid bumping corners, and keep free of finger prints, grease stains, smears, and contamination by materials capable of staining glass.

   2. Remove from Site all broken, cracked, scratched, or otherwise damaged or imperfect material.
   3. Unpack glass in accordance with manufacturer's printed instructions.
   4. Do not remove labels until final clean-up.

1.06 PROTECT CONDITIONS

A. Environmental Requirements:
   1. Do not install glazing when ambient temperature is less than 50 degrees F.
   2. Maintain minimum ambient temperature before, during and 24 hours after installation of glazing compounds.

B. Field Measurements: Verify that field measurements are as indicated on drawings.

1.07 COORDINATION

A. Coordinate locations of tempered glass with drawings and as required by local governing codes and requirements.

1.08 WARRANTY

A. Provide three year manufacturer's warranty under provisions of Section 01700.
   1. Include coverage for sealed glass units from seal failure, interpane dusting or misting, and replacement of same.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. Acceptable Glass Manufacturers:
   1. Guardian.
   2. Libby - Owens - Ford Glass Company.
   3. Pittsburgh Plate Glass Company.

B. Substitutions: Under provisions of Section 01600.

2.02 GLASS MATERIALS

A. Float Glass: ASTM C1036, Type 1 transparent flat, Class 1 clear, 1/4 inch thick.

B. Safety Glass: Clear fully tempered conforming to ANSI Z97.1; 1/4 inch thick.

C. Sealed Insulating Glass Materials: [ADD A]

1. **Insulated Glass Units - Low E: ASTM E774 and E773; double pane with single sealed insulated unit; outer pane of 1/4 inch clear glass inner pane of 1/4 inch Low E on clear glass, visible light transmittance of 78% percent, maximum overall U factor of 0.54, maximum center of glass shading coefficient of 0.57.**

2. **Insulated Tempered Glass Units - Low E: ASTM E774 and E 773; double pane single sealed insulated unit, outer pane of 1/4 inch clear tempered glass, Inner pane of 1/4 inch Low E clear tempered glass, maximum overall U factor of 0.54, visible light transmittance of 78%, maximum center of glass shading coefficient of 0.57.**

2.03 SEALANTS

A. Silicone Sealant: ASTM C920, Type S, Single component, non-bleeding, non staining; cured with Shore A hardness of 15-25; color as selected; Proglaze as manufactured by Tremco.

2.04 GLAZING ACCESSORIES

A. Setting Blocks: Neoprene, 80-90 Shore A durometer hardness, length of 0.1 inch for each square foot of glazing or minimum 4 inch x width of glazing rabbet space minus

1/16 inch x height to suit glazing method and pane weight and area.

B. Spacer Shims: Neoprene 50 - 60 Shore A durometer hardness, minimum 3 inch long x one half height of glazing stop x thickness to suit application, self adhesive on one face.

C. Glazing Splines: Resilient extruded shape to suit glazing channel retaining slot.

D. Glazing Clips: Manufacturer's standard type.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify prepared openings under provisions of Section 01039.

B. Verify that openings for glazing are correctly sized and within tolerance.

C. Verify that surfaces of glazing channels or recesses are clean, free of obstructions, 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. Prime surfaces scheduled to receive sealant.

3.03 QUALITY CONTROL

A. Field inspection will be performed under provisions of Section 01400.

B. Inspection will monitor quality of glazing.

3.04 MANUFACTURER'S FIELD SERVICES

A. Glass and glazing product manufacturers shall provide field surveillance of installation of their products as required.

B. Monitor and report installation procedures, unacceptable conditions.

3.05 CLEANING

A. Clean work under provisions of 01700.

B. Remove glazing materials from finish surfaces.

C. Remove labels after work is complete.

D. Clean glass.

3.06 PROTECTION OF FINISHED WORK

A. Protect finished Work under provisions of Section 01500.

B. After installation, mark pane with an 'X' by using removable plastic tape or paste. Do not mark heat absorbing or reflective glass units.

END OF SECTION

SECTION 09110
NON-LOAD BEARING METAL FRAMING

PART 1 GENERAL

1.01 SUMMARY

A. Section Includes:
1. Formed metal stud framing at interior partition locations.
2. Framing accessories.

B. Related Sections:
1. Section 06112 - Framing and Sheathing
2. Section 07210 - Building Insulation: Insulation within stud framing.
3. Section 09250 - Gypsum Board.

1.02 REFERENCES

A. American Society for Testing and Materials (ASTM):
1. ASTM A591 - Steel Sheet, Cold-Rolled, Electrolytic Zinc-Coated.

B. American Society for Testing and Materials (ASTM):
1. ASTM A525 - General Requirements for Steel Sheet, Zinc-Coated (Galvanized) by the Hot-Dip Process.
2. ASTM C645 - Non-Load (Axial) Bearing Steel Studs, Runners (Track) and Rigid Furring Channels for Screw Application of Gypsum Board.
3. ASTM C 754 - Installation of Steel Framing Members to Receive Screw-Attached Gypsum Wallboard, Backing Board, or Water-Resistant Backing Board.

C. Federal Specifications (FS):
1. FS TT-P-645 - Primer, Paint, Zinc-Chromate, Alkyd Type.

D. Gypsum Association (GA):
1. GA 203 - Installation of Screw-Type Steel Framing Members to Receive Gypsum Board.

E. Metal Lath and Steel Framing Association (ML/SFA):
1. ML/SFA Specifications.

1.03 SYSTEM DESCRIPTION

A. Non-load bearing metal stud framing system for interior walls, with batt type acoustic insulation specified in Section 07210, and gypsum board specified in Section 09250.

B. Maximum Allowable Deflection: 1/270 span.

C. Design system to accommodate construction tolerances, deflection of building structural members, and clearances of intended openings.

1.04 QUALITY ASSURANCE

A. Perform work in accordance with GA 203 and ASTM C754.

1.05 SEQUENCING AND SCHEDULING

A. Sequence work with other work directly affected by this Section.

B. Coordinate work under provisions of Section 01039.

C. Coordinate work of related Sections.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. Acceptable Manufacturers:
   1. National Gypsum Co.
   2. Dietrich Metal Framing.
   3. U.S. Gypsum Co.

B. Substitutions: Under provisions of Section 01600.

2.02 STUD FRAMING MATERIALS

A. Studs: ASTM A591/C645, electrogalvanized, non-load bearing rolled steel, channel shaped, punched for utility access, as scheduled:
   1. Width: 3½ or 6 inches as indicated on drawings.
   2. Thickness: 25 gauge except 20 gauge where indicated in ASTM C754.

B. Runners: Of same material and finish as studs, bent leg retainer notched to receive studs with provision for crimp locking to stud. Ceiling runners with extended legs.

C. Furring and Bracing Members: Of same material and finish as studs, thickness to suit purpose.

D. Fasteners: GA 203. Self-drilling, self-tapping screws.

E. Metal Backing: 20 gauge galvanized steel for reinforcement and backings of wall mounted items. Verify loads prior to installation of backing.

F. Anchorage Devices: Drilled expansion bolts.

2.03 FABRICATION

A. Fabricate assemblies of framed sections to sizes and profiles required; with framing members fitted, reinforced, and braced to suit Contract Document design requirements.

B. Fit and assemble in largest practical sections for delivery to site, ready for installation.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify that conditions are ready to receive work.

B. Verify field measurements are as instructed by manufacturer.

C. Verify that rough-in utilities are in proper location.

D. Beginning of installation means installer accepts existing conditions.

3.02 ERECTION

A. Align and secure top and bottom runners at 16 inches oc.

B. Fit runners under and above openings; secure intermediate studs at spacing of wall studs.

C. Install studs vertically at 16 inches oc.

D. Connect studs to tracks using fastener method.

E. Stud splicing not permissible.

F. Construct corners using minimum three studs.

G. Double studs at wall openings, door and window jambs, and not more than 2 inches each side of openings.

H. Brace stud framing system and make rigid.

I. Coordinate erection of studs with requirements of door and window frame supports and attachments.

J. Align stud web openings.

K. Coordinate installation of bucks, anchors, and blocking with electrical and mechanical work to be placed in or behind stud framing.

L. Blocking: Secure wood blocking to studs.

M. Refer to Drawings for indication of partitions extending to ceiling only and for partitions extending through ceiling to structure above. Maintain clearance under structural building members to avoid deflection transfer to studs. Provide extended leg ceiling runners.

N. Coordinate placement of insulation in multiple stud spaces made inaccessible after stud framing erection.

3.03 TOLERANCES

A. Maximum Variation From True Position: 1/8 inch.

B. Maximum Variation of any Member from Plane: 1/16 inch.

END OF SECTION

SECTION 09250
GYPSUM BOARD

PART 1 GENERAL

1.01 SUMMARY

A. Section Includes:
1. Gypsum board.
2. Taped and sanded joint treatment.
3. Gypsum board accessories.

B. Related Work:
1. Section 06112 - Framing and Sheathing.
2. Section 07210 - Building Insulation: Thermal and acoustic insulation.
3. Section 07900 - Sealants.
4. Section 08110 - Steel Doors and Frames.
5. Section 09110 - Non-Load Bearing Wall Framing.
6. Section 09511 - Suspended Acoustical Ceilings.
7. Section 09900 - Painting.

1.02 REFERENCES

A. American Society for Testing and Materials (ASTM):
1. ASTM C36 - Gypsum Wallboard.
2. ASTM C514 - Nails for the Application of Gypsum Wallboard.
3. ASTM C630 - Water Resistant Gypsum Backing Board.
4. ASTM C646 - Steel Drill Screws for the Application of Gypsum Sheet Material to Light Gage Steel Studs.

B. Gypsum Association (GA):
1. GA-201 - Gypsum Board for Walls and Ceilings
2. GA-216 - Recommended Specifications for the Application and Finishing of Gypsum Board.

1.03 QUALITY ASSURANCE

A. Applicator Qualifications: Company specializing in gypsum board work with 3 years documented experience.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. Acceptable gypsum board system manufacturers:
1. Georgia Pacific.
2. National Gypsum Company.
3. U.S. Gypsum Company.

B. Substitutions: Under provisions of Section 01600.

2.02 GYPSUM BOARD MATERIALS

A. Gypsum Face Panels: ASTM C 36. Long edges tapered and round or beveled. Type "X" gypsum core, 5/8-inch thick.

B. Moisture Resistant Gypsum Board: ASTM C630; 5/8 inch thick, maximum permissible length; ends square cut, tapered and beveled edges.

2.03 ACCESSORIES

A. Acoustical Insulation: Refer to Section 07210.

B. Corner Beads: Metal.

C. Edge Trim: GA 201 and GA216, type as required.

D. Joint Materials: GA 201 and GA 216; reinforcing tape, joint compound, adhesive, water, and fasteners.

E. Wall Channel: Aluminum end wall closure. Color shall match storefront.

F. Sealants: Polyisobutylene Mastic, and Acrylic-Latex.

G. Gypsum Board Metal Trim:
1. Material: 26 gauge galvanized steel.
2. External Corner Beads: U.S. Gypsum Dur-A-Bead Corner.
3. Edge Trim: U.S. Gypsum #200 Series to form corners and edges as required.
4. Control Joint: U.S. Gypsum Co. Control Joint No. 093 for use at all exterior canopy soffit joint conditions as shown on the drawings.

H. Fasteners: Screws, ASTM C 646.

I. Wall Texture: Smooth Finish.

J. Ceiling Texture: Smooth Finish.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify that site conditions are ready to receive work.

B. Beginning of installation means acceptance of substrate.

3.02 GYPSUM BOARD INSTALLATION

A. Install gypsum board in accordance with Uniform Building Code and manufacturer's instructions.

B. Single layer standard gypsum board: Erect in most economical direction, with ends and edges occurring over firm bearing.

C. Exterior gypsum soffit board: Erect perpendicular to supports, with staggered end joints over supports.

D. Fasteners:
   1. Use screws when fastening gypsum board to metal furring or framing.
   2. Use screws when fastening gypsum board to wood furring or framing.
   3. Use screws when fastening accessories.
   4. Staples may only be used when securing the first layer of double layer applications.

E. Joint Sealers: Treat cut edges and holes in moisture resistant gypsum board and exterior gypsum ceiling board with sealant.

F. Control Joints: Place control joints consistent with lines of building spaces as indicated.

G. Corner Beads: Place corner beads at external corners. Use longest practical length. Place edge trim where gypsum board abuts dissimilar materials.

3.03 JOINT TREATMENT

A. Tape, fill, and sand exposed joints, edges, and corners to produce smooth surface ready to receive finishes.

B. Feather coats onto adjoining surfaces so that camber is maximum 1/32 inch.

C. Erect in accordance with Contract Documents, reviewed Shop Drawings and manufacturer's instructions.

3.04 TOLERANCES

A. Maximum Variation from True Flatness: 1/8 inch in 10 feet in any direction.

END OF SECTION

SECTION 09511
SUSPENDED ACOUSTICAL CEILINGS

PART 1 GENERAL

1.01 SUMMARY

A. Section Includes:
1. Suspended metal grid ceiling system.
2. Acoustical tile.
3. Non-fire rated assembly.
4. Perimeter trim.
5. Contractor designed structural connections and anchorages to meet seismic requirements.

B. Related Sections:
1. Section 09250 - Gypsum Board
2. Division 15 - Mechanical: Sprinkler heads in ceiling system.
3. Division 16 - Electrical: Light fixtures in ceiling system.
4. Appendix A – NWCB Technical Document 401

1.02 REFERENCES

A. American Society for Testing and Materials (ASTM):
1. ASTM C635 - Metal Suspension Systems for Acoustical Tile and Lay-in Panel Ceilings.
2. ASTM C636 - Installation of Metal Ceiling Suspension Systems for Acoustical Tile and Lay-in Panels.

1.03 SYSTEM DESCRIPTION

A. Installed System:
1. System shall be designed to meet Zone 3 seismic requirements.

1.04 QUALITY ASSURANCE

A. Manufacturer Qualifications: Company specializing in manufacture of ceiling suspension system and ceiling tile with three years minimum documented experience.

B. Installer Qualifications: Company with three years minimum documented experience and approved by manufacturer.

C. Regulatory Requirements:
1. Conform to applicable code for fire rated assembly and combustibility requirements for materials.
2. Conform to all local seismic requirements.

1.05 ENVIRONMENTAL REQUIREMENTS

A. Maintain uniform temperature of minimum 60 degrees F and humidity of 20 to 40 percent prior to, during, and after installation, unless otherwise recommended by

manufacturer.

1.06 SEQUENCING/SCHEDULING

A. Do not install acoustical ceilings until building is enclosed, sufficient heat is provided, dust generating activities have terminated, and overhead work is completed, tested, and approved.

B. Schedule installation of acoustic units after interior wet work is dry.

1.07 EXTRA STOCK

A. Provide extra quantity of acoustic units under provisions of Section 01700.

B. Provide minimum 3% of total tile area installed to Owner. Furnish in full, unopened cartons, with original labels intact and legible.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. Acceptable Suspension System Manufacturers:
1. Armstrong.
2. U.S.G. Interiors.
3. Chicago.

B. Acceptable Acoustic Unit Manufacturers:
1. Armstrong.
2. Celotex under provisions of Section 01600.
3. U.S.G. Interiors.
4. Donn.

C. Substitutions: Under provisions of Section 01600.

2.02 EXPOSED GRID SYSTEM COMPONENTS

A. Structural Classification: Intermediate-duty, no deflection in excess of 1/360 of the span or .133 inch (1/8 inch in 14-foot span).

B. Main Runners: 1-1/2 inch minimum height, double web design and rectangular bulb, 15/16 inch exposed flange, hanger wire holes at 2 inch o.c., 12'-0" long, .015 inch minimum thickness, integral reversible splice and expansion notch for controlled buckling.

C. Cross tees 1-1/8 inch minimum height, double web design and a rectangular bulb, 16/16 inch exposed lange, 4'-0" long, .015 inch minimum thickness.

D. Coatings: As required for normal use environments with white painted finish on exposed runners, comply with ASTM C 635.

E. Wall Moldings: Angle with hemmed edges finished to match exposed runners.

F. Other Edge Conditions: All edges including columns to have angle brackets for T-bar and ceiling tile support.

G. Hanger Wire: #12 gauge galvanized steel wire.

H. Attachment Devises: Manufacturer approved type capable of carrying 5 times the ceiling load.

I. Hold-Down Clips: As required by local codes, provide by suspended ceiling system manufacturer.

2.03 ACOUSTIC UNIT MATERIALS

A. Acoustic Panels: Conforming to following:
   1. Size: 24 x 48 inches.
   2. Thickness: 5/8 inches.
   3. Composition: Mineral.
   4. Light Reflectance: LR1.
   5. NRC Range: .55 to .65.
   6. STC Range: 35 to 39.
   7. Fire Hazard Classification: Flame / Spread 25.
   8. Edge: Square.
   9. Surface Color: White.
   10. Surface Finish: Non-directional fissured.
   11. Style: ‘Cortega’ Square Lay-in; Offices and Breakroom
   12. Style: ‘Kitchen Zone’; square lay-in; Dog grooming and bathing rooms

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify that existing conditions are ready to receive work.

B. Verify that layout of hangers will not interfere with other work.

C. Beginning of installation means acceptance of existing conditions.

3.02 INSTALLATION

A. Lateral Bracing: Provide all internal bracing and struts as required by the Latest Edition of the Uniform Building Code and local building code requirements.

B. Install system in accordance with Contract Documents, local seismic requirements, ASTM C636 and manufacturer's instructions, and as supplemented in this Section.

C. Install system capable of supporting imposed loads to deflection of 1/360 maximum.

D. Install after major above ceiling work is complete. Coordinate the location of hangers with other work.

E. Hang system independent of walls, columns, ducts, pipes and conduit. Where carrying members are spliced, avoid visible displacement of face plane of adjacent members.

F. Where ducts or other equipment prevent regular spacing of hangers, reinforce nearest affected hangers to span extra distance.

G. Locate system on room axis according to reflected plan.

H. Do not support components on main runners or cross runners if weight causes total dead load to exceed deflection capability. Support fixture loads by supplementary hangers located within 6 inches of each corner; or support components independently.

I. Do not eccentrically load system, or produce rotation of runners.

J. Install edge molding at intersection of ceiling and vertical surfaces, using longest practical lengths. Miter corners. Provide edge moldings at junctions with other interruptions.

K. Fit acoustic units in place, free from damaged edges or other defects detrimental to appearance and function.

L. Install acoustic units level, in uniform plane, and free from twist, warp and dents.

M. If required by codes, install hold-down clips to retain panels tight to grid system as recommended by manufacturer.

N. If fixtures cause excessive deflection, the fixture shall be independently supported or the grid shall be supplementally supported within 6-inches of each corner with hanger wire.

3.03 TOLERANCES

A. Variation from Flat and Level Surface: 1/8 inch in 14 ft.

END OF SECTION

SECTION 09671
TEXTURED FLOOR COATINGS

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Surface preparation.

B. Textured Floor Coatings.

1.2 RELATED SECTIONS

A. Section 03300 - Cast-In-Place Concrete

B. Section 09900 - Paint

1.3 REFERENCES

A. ASTM D 1308 - Standard Test Method for Effect of Household Chemicals on Clear and Pigmented Organic Finishes.

B. OTC Compliant - Ozone Transport Commission (OTC) Volatile Organic Compound s Regulations for Paints.

1.4 SUBMITTALS

A. Submit under provisions of Section 01300.

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. Selection Samples: For each finish product specified, two complete sets of color chips representing manufacturer's full range of available colors and patterns.

D. Verification Samples: For each finish product specified, two samples, minimum size 6 inches (150 mm) square, representing actual product, color, and patterns.

E. Manufacturer's Certificates: Certify products meet or exceed specified requirements.

1.5 QUALITY ASSURANCE

A. Regulatory Requirements: Product shall comply with federal, state, and local volatile organic compounds (VOC) regulations.

B. Manufacturer Qualifications: All products specified in this section will be supplied by a single manufacturer with a minimum of ten years experience.

C. Installer Qualifications: A firm or individual experienced in applying paints and coatings similar in material, design, and extent to those indicated for this

project, whose work has resulted in applications with a record of successful in-service performance.

D. Mock-Up: Provide a mock-up for evaluation of surface preparation techniques and application workmanship.
   1. Finish areas designated by Architect.
   2. Do not proceed with remaining work until workmanship, color, and sheen are approved by Architect.
   3. Refinish mock-up area as required to produce acceptable work.
   4. Accepted mock-ups shall be comparison standard for remaining Work

E. Pre-Installation Meeting:
   1. Convene at job site seven calendar days prior to scheduled beginning of construction activities of this section to review requirements of this section.
   2. Require attendance by representatives of the following:
      a. Sealer manufacturer.
      b. Installer of this section.
      c. Other entities directly affecting, or affected by, construction activities of this section.
   3. Notify Architect four calendar days in advance of scheduled meeting date.

1.6 DELIVERY, STORAGE, AND HANDLING

A. Store products in manufacturer's unopened packaging until ready for installation.

B. Store and dispose of materials in accordance with requirements of local authorities having jurisdiction.

1.7 PROJECT CONDITIONS

A. Maintain environmental conditions (temperature, humidity, and ventilation) within limits recommended by manufacturer for optimum results. Do not install products under environmental conditions outside manufacturer's absolute limits.

B. Do not apply coatings to surfaces below 50 degrees F (10 degrees C) or above 95 degrees F (48 degrees C) unless recommended by the manufacturer.

C. Do not apply when rain is predicted within 24 hours or less than 1 day after surface has been wet.

D. Do not apply in high or gusty winds.

1.8 EXTRA MATERIALS

A. See Section 01600 for additional provisions.

B. Furnish extra paint materials from the same production run as the materials applied and in the quantities described below. Package with protective covering for storage and identify with labels describing contents. Deliver materials to the Owner.

C. Quantity: Furnish Owner with an addition three percent, but not less than 1 gallon (3.8 l) or one case, as appropriate, of each material and color applied.

PART 2 PRODUCTS

2.1 MANUFACTURERS

A. Acceptable Manufacturer: Stonehard

B. Substitutions: **No Substitutions Allowed.**

2.2 MATERIALS

A. Stonclad GS; Color: Pewter

PART 3 EXECUTION

3.1 EXAMINATION

A. Do not begin installation until substrates have been properly prepared.

B. Verify that substrates are prepared in accordance with manufacturer's instructions.

C. If substrate 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 materials specified and for the substrate under the project conditions.

C. Protect adjacent surfaces to prevent accidental application to surfaces not indicated to receive sealer; remove accidental applications from surfaces immediately, following manufacturer's instructions.

D. Surfaces must be structurally sound, thoroughly cleaned, dry and free from dust, dirt, oils, glossy or loose paint, glue, surface sealer and other contaminants.

E. Concrete must have cured for a minimum of 30 days before application. Etch the surface with **approved** concrete etching solution to allow for proper penetration and adhesion. After etching, rinse the surface thoroughly and let dry. If muriatic acid is used, it must be neutralized before proceeding. Test surface for immediate water penetration before proceeding.

F. Previously sealed, stained or painted concrete: Remove loose or peeling paint and degloss surface by sanding with 150-200 grit paper. Follow with a general cleaning. Rinse thoroughly and let dry.

3.3 APPLICATION

A. Apply textured coating in accordance with manufacturer's instructions.

B. Apply each coat to uniform appearance. Apply each coat of texture perpendicular to the preceding coat unless specified otherwise.

C. Spray apply the finish coat as recommended by the manufacturer.

D. Roller apply the finish coat as recommended by the manufacturer.

E. Allow each coat to dry thoroughly prior to applying a second or finish coat

3.4 CLEAN-UP

A. Immediately remove coatings that fall on surrounding areas and surfaces not scheduled to be coated.

B. Remove temporary coverings and protection of surrounding areas and surfaces.

3.5 PROTECTION

A. Protect installed products until completion of project.

B. Touch-up, repair or replace damaged surfaces before Substantial Completion.

END OF SECTION

SECTION 09900
PAINTING

PART 1 GENERAL

1.01 SUMMARY

A. Section Includes:
1. Surface preparation.
2. Interior and exterior painting and finishing.
3. Surface finish schedule.
4. Color selection schedule.

B. Related Sections:
1. Section 05120 - Structural Steel.
2. Section 05500 - Metal Fabrication: Shop primed items.
3. Section 07120 - Fluid Applied Elastomeric Waterproofing.
4. Section 07600 - Flashing and Sheet Metal.
5. Section 07722 - Roof Hatches.
6. Section 08110 - Steel Doors and Frames.
7. Section 08210 - Wood Doors.
8. Section 08305 - Access Doors.
9. Section 09250 - Gypsum Board.
10. Section 09671 - Texture Floor Coatings
10. Division 15 - Mechanical Identification.
11. Division 16 - Electrical Identification.

1.02 REFERENCES

A. American Society for Testing Materials (ASTM):
1. ASTM D16 - Definitions of Terms Relating to Paint, Varnish, Lacquer, and Related Products.

1.03 DEFINITIONS

A. Conform to ASTM D16 for interpretation of terms used in this Section.

1.04 SUBMITTALS

A. Submit under provisions of Section 01300.

B. Samples: Submit three samples 8 x 8 inch
in size illustrating range of colors available for each surface finishing product scheduled, for selection.

1.05 QUALITY ASSURANCE

A. Applicator Qualifications: Company specializing in commercial painting and finishing with minimum three years documented experience, and approved by product manufacturer.

B. Regulatory Requirements: Conform to applicable code for flame/fuel/smoke rating requirements for finishes.

1.06 DELIVERY, STORAGE, AND HANDLING

A. Deliver products to site, store and protect under provisions of Section 01600.

B. Deliver products to site in sealed and labeled containers; inspect to verify acceptance.

C. 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.

D. Store paint materials at minimum ambient temperature of 45 degrees F and a maximum of 90 degrees F in well ventilated area, unless required otherwise by manufacturer's instructions.

E. Take precautionary measures to prevent fire hazards and spontaneous combustion.

1.07 ENVIRONMENTAL REQUIREMENTS

A. Provide continuous ventilation and heating facilities to maintain surface and ambient temperatures above 45 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 50 percent, unless required otherwise by manufacturer's instructions.

C. Minimum Application Temperatures for Latex Paints: 45 degrees F for interiors; 50 degrees F for exterior; unless required otherwise by manufacturer's instructions.

D. Provide lighting level as required at substrate surface.

1.08 EXTRA STOCK

A. Provide two gallon containers of each exterior and interior color to Owner.

B. Label each container with color, room locations, and exterior location in addition to the manufacturer's label.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. Acceptable Manufacturers:
   1. Sherwin Williams Company.
   2. Miller Paint Co.
   3. Rodda Paint Co.

B. Substitutions: Submit during bidding.

C. Products for each general purpose shall be by single manufacturer. Do not use products by different manufacturers over one another, except for shop prime coats specified in other Sections.

2.02 MATERIALS

A. Coatings:
1. Ready mixed, except field catalyzed coatings. Process pigments to a soft paste consistency, capable of being readily and uniformly dispersed to homogeneous coating.
2. Good flow and brushing properties; capable of drying or curing free of streaks or sags.

B. Accessory Materials: Linseed oil, shellac, turpentine, paint thinners and other materials not specifically indicated but required to achieve finishes specified, of commercial quality.

2.03 FINISHES

A. Refer to schedule at end of Section and drawings for surface finish and color schedule.

B. Allow 15% extra paint, or as required, for deep tone colors.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify that substrate conditions 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. Do not apply finishes unless moisture content of surfaces are below following maximums as recommended by the manufacturer

D. Beginning of installation means acceptance of existing substrate.

3.02 PREPARATION

A. Remove electrical plates, hardware, light fixture trim, and fittings prior to preparing surfaces or 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:

1. Remove mildew by scrubbing with solution of tri-sodium phosphate and bleach.
2. Rinse with clean water and allow surface to dry.

E. Gypsum Board Surfaces:
1. Latex fill minor defects.
2. Spot prime defects after repair.

F. Galvanized Surfaces:
1. Remove surface contamination and oils and wash with solvent.
2. Apply coat of etching primer.

G. Concrete and Unit Masonry Surfaces Scheduled to Receive Paint Finish:
1. Remove dirt, loose mortar, scale, salt or alkali powder, and other foreign matter.
2. Remove oil and grease with solution of tri-sodium phosphate; rinse well and allow to dry.
3. Remove stains caused by weathering of corroding metals with solution of sodium metasilicate after thoroughly wetting with water.
4. Allow to dry.

H. Uncoated Steel and Iron Surfaces:
1. Remove grease, scale, dirt, and rust.
2. Where heavy coatings of scale are evident, remove by wire brushing or sandblasting; clean by washing with solvent.
3. Apply treatment of phosphoric acid solution, ensuring weld joints, bolts, and nuts are similarly cleaned.
4. Spot prime paint after repairs.

I. Shop Primed Steel Surfaces:
1. Sand and scrape to remove loose primer and rust.
2. Feather edges to make touch-up patches inconspicuous.
3. Clean surfaces with solvent. Prime bare steel surfaces.

J. Interior Wood Items Scheduled to Receive Finish:
1. Wipe off dust and grit prior to priming.
2. Seal knots, pitch streaks, and sappy sections with sealer.
3. Fill nail holes and cracks after primer has dried.
4. Sand between coats.

K. Doors Scheduled for Painting: Seal top and bottom edges with primer.

3.03 PROTECTION

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

B. Repair damage to other surfaces caused by work of this Section.

C. Furnish drop cloths, shields, and protective methods to prevent spray or droppings from disfiguring other surfaces.

D. Remove empty paint containers from site.

3.04 APPLICATION

A. Apply products in accordance with manufacturer's instructions.

B. Do not apply finishes to surfaces that are not dry.

C. Apply each coat to uniform finish.

D. Apply each coat of paint slightly darker than preceding coat unless otherwise approved.

E. Sand lightly between coats to achieve required finish.

F. Allow applied coat to dry before next coat is applied.

G. Where clear finishes are required, tint fillers to match wood. Work fillers into the grain before set. Wipe excess from surface.

3.05 FINISHING MECHANICAL AND ELECTRICAL EQUIPMENT

A. Replace identification markings on mechanical or electrical equipment when painted accidentally.

B. Paint both sides and edges of plywood backboards for electrical and telephone equipment before installing equipment.

C. Replace electrical plates, hardware, light fixture trim, and fittings removed prior to finishing.

D. Paint all exterior exposed mechanical and electrical equipment color as selected by Architect.

3.06 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 waste, cloths, and material which may constitute a fire hazard, place in closed metal containers and remove daily from site.

3.07 SCHEDULE - SHOP PRIMED ITEMS FOR SITE FINISHING

A. Metal Fabrications, Section 05500 and Flashing and Sheet Metal, Section 07600.

3.08 SCHEDULE - EXTERIOR SURFACES

A. Painted Unit Masonry:

1. Provide finishes as described in Section 07120 - Fluid Applied Elastomeric Waterproofing.

B. Synthetic Plaster:
1. Provide finishes as described in Section 07240 - EIFS.

C. Wood - Painted:
1. Latex.

D. Wood - Transparent
1. Two coats varnish.

E. Pavement Markings
1. Two coats yellow or white as indicated on drawings.

F. Concrete
1. One coat primer sealer latex.
2. Two coats latex.

G. Steel - Unprimed
1. One coat zinc chromate primer.
2. Two coats alkyd enamel, semi-gloss.

H. Steel - Shop Primed
1. Touch-up with zinc rich primer.
2. Two coats alkyd enamel, semi-gloss.

I. Steel - Galvanized (not chain link mesh)
1. One coat zinc chromate primer.
2. Two coats Waterborne Acrylic Dryfall, semi-gloss.

J. Aluminum - Factory Finish

3.09 SCHEDULE - INTERIOR SURFACES COATING REQUIREMENTS

A. Wood - Painted
1. One coat latex prime sealer.
2. Two coats latex, semi-gloss.

B. Wood - Transparent
1. Filler coat (for open grained wood only).
2. Two coats, varnish, semi-gloss.

C. Concrete, Concrete Block, Cement Plaster.
1. One coat block filler.
2. One coat primer sealer latex.
3. Two coat latex, semi-gloss.

D. Exposed Steel - Unprimed.
1. One coat zinc chromate primer.
2. Two coats latex, semi-gloss.

E. Exposed Steel - Primed
   1. Touch-up with original primer.
   2. Two coats latex, semi-gloss.

F. Unexposed Steel - Unprimed
   1. One coat zinc rich primer.

G. Unexposed Steel - Primed
   1. Touch-up with original primer.

H. Steel - Galvanized
   1. One coat zinc chromate primer.
   2. Two coats Waterborne Acrylic Dry Fall, semi-gloss.

I. Concrete Flooring
   1. See Drawings and Section 09671

J. Gypsum Board
   1. One coat latex primer sealer.
   2. Two coats latex semi-gloss.

3.10 SCHEDULE – See Drawings for Schedule and Locations

END OF SECTION

SECTION 09975
FIBERGLASS REINFORCED PANELS

PART 1 GENERAL

1.01 WORK INCLUDED

A. Provide installation of fiberglass reinforced panels as indicated on Drawings and specified herein.

B. Fiberglass reinforced panels shall be installed over 5/8" moisture resistant gypsum board in all conditions.

1.02 WORK SPECIFIED ELSEWHERE

A. Rough Carpentry: Section 06112 - Framing and Sheathing.

B. Caulking: Section 07900 - Joint Sealants.

1.03 REFERENCES

A. Codes and Standards: To applicable codes. Flamespread not in excess of 20 feet, fuel contributed O, smoke developed 200 per ASTM E-84, Class A.
   1. Industry Standard, WM4-77, Standard Wood.

1.04 SUBMITTALS

A. Submit under provisions of Section 01300.

B. Product Data:
   1. Provide product data on panel construction, hardware, and accessories.
   2. Submit manufacturers Installation Instructions.

PART 2 PRODUCTS

2.01 ACCEPTABLE MANUFACTURERS

A. Kemlite Corporation.

B. Substitutions: Under provisions of Section 01600.

2.01 FIBERGLASS REINFORCED PANELS (FRP)

A. Provide and install full height fiberglass reinforced panels (FRP) over gypsum board backing as indicated on the Drawings.

B. Prefinished Panels: Fiberglass reinforced polyester panels, as manufactured by Kemlite Corporation, or approved equal.
Color: Light Gray

Finish: Smooth

C. Moldings: Furnish prefinished harmonizing PVC moldings to match panels for all joints and exposed edges.

D. Adhesives: Webtex #176 adhesive. Caulk joints with CE #725 or Dow Silicone Caulking, USDA approved.

E. Fasteners: Southco Drive Rivets or as recommended by panel manufacturer.

PART 3 EXECUTION

3.01 INSTALLATION

A. Install Fiberglass Reinforced Panels (FRP) as recommended by the manufacturer.
1. Prior to all work of this Section, carefully inspect the installed work of other trades and verify that all such work is sufficiently complete to complete the installation of the work of this Section.
2. Comply with manufacturers published instructions. Have all recommended tools on hand and make a room layout and cutting schedule before starting installation.
3. Cut, fit, and try each panel prior to final fastening. Spread adhesive, set, and press panels in place, brace as recommended.
4. Trim panel edges and joints with moldings using CE Silicone #785, and clean panels.
5. Install FRP panels full height to bottom of ceiling in Dog Bathing. All other areas per Drawings.

B. Install plumb, level, true, and straight. Shim as required.

C. Cut to fit, scribe where necessary.

END OF SECTION

SECTION 10160
METAL TOILET COMPARTMENTS

PART 1 GENERAL

1.01 SUMMARY

A. Section Includes:
1. Porcelain Sheet Steel toilet compartments, floor mounted, head rail braced.
2. Urinal screens wall mounted floor supported.

B. Related Sections:
1. Section 06112 - Framing and Sheathing: In wall framing and plates for partition panel support.
2. Section 10800 - Toilet and Bath Accessories.

1.02 REFERENCES

A. American National Standards Institute/American Society for Testing and Materials (ANSI/ASTM):
1. ANSI A117.1 - Specifications for Making Buildings and Facilities Accessible to and Usable by Physically Handicapped People.
2. ANSI/ASTM A526 - Steel Sheet, Zinc-Coated (Galvanized) by the Hot-Dip Process, Commercial Quality.
3. ASTM A167 - Stainless and Heat Resisting Chromium-Nickel Steel Plate, Sheet and Strip.

B. Federal Specifications (FS):
1. FS RR-P-1352 - Partitions, Toilet, Complete.

1.03 SUBMITTALS

A. Submit under provisions of Section.

B. Shop Drawings:
1. Indicate on Shop Drawings, partition plan and elevation views, dimensions, details of floor supports, and door swings.

C. Samples: Submit two samples 2x3 inches in size illustrating panel finish, color, and sheen.

PART 2 PRODUCTS

2.01 APPROVED MANUFACTURERS AND COLORS:

A. Manufacturer: Global Steel Products: Embassy; Charcoal #2123

2.02 TYPE OF CONSTRUCTION: Floor anchored type with anti-grip headrail brace, flush

panel with powder coated finish.

2.03 STANDARDS

A. As required within the Americans Disability Act (A.D.A.) for public restrooms.

2.04 MATERIALS:

A. Metal Compartments and Screens:
   1. Material and Finishes:
      a. Partition, Pilaster and Door Material: Cold-rolled, stretcher leveled steel 22 ga at panel faces and 18 ga at pilaster faces.
      b. Protective Coating: ASTM A-164, 0.00015 inch thick zinc coating applied to all surfaces.
      c. Finishes: Powder Coated.
      d. Pilaster Base Material: Stainless steel.
      e. Fittings Material: All fittings to be same material and finish.
   2. Compartments:
      a. Panel Type: Flush.
      b. Support: Floor supported with Anti-grip headrail brace.
      c. Pilaster Shoes: Stainless steel.
      d. Built-in privacy strip on latch side
   3. Dimensions:
      a. Refer to Drawings.
   4. Screens:
      a. Include wall supported, floor mounted urinal screens where indicated.
         Appearance: Match compartments.

B. Hardware:
   1. For all hardware finish shall be stainless steel.
   2. Fasteners:
      a. Material: Corrosion-resistant.
      b. Finish: Match fittings.

C. Reinforcement:
   1. Material: 12 ga. steel.
   2. Extent of Work: Provide where necessary to receive anchors for grab bars and other attached equipment. Verify locations.

D. Fabrication:
   1. Accurately form metal to required sizes and shapes. Grind and dress any welds to form smooth, flush surfaces. Do not use metallic fillers to conceal defects.

E. Internal Reinforcement: Provide in areas of attached hardware and fittings. Mark locations of reinforcement for partition mounted washroom accessories.

F. Factory Finishing:
   1. Clean panels as recommended by manufacturer.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify that site conditions are ready to receive work and opening dimensions are as indicated on shop drawings.

B. Verify correct spacing of plumbing fixtures.

C. Verify correct location of built-in framing, anchorage, and bracing, where required.

D. Beginning of installation means acceptance of existing substrate.

3.02 INSTALLATION

A. Install partitions rigid, straight, plumb and level in accordance with manufacturer's printed instructions. Set units with not more than 1/2" between pilasters and panels, not more than 1" between panels and walls, and not more than 3/16" between pilasters and doors.

B. Hardware Adjustments: Adjust and lubricate hardware for proper operation after installation:
   1. Set hinges on in-swing doors to hold doors open approximately 30 degrees from the closed position when unlatched.
   2. Set hinges on out-swing doors to hold doors closed when unlatched.

C. Install work secure, plumb, and level in accordance with Contract Documents, reviewed Shop Drawings and manufacturers instructions.

D. Maintain 3/8 to 1/2 inch space between wall and panels and between wall and end pilasters.

E. Attach continuous panel brackets securely to walls using anchor devices.

F. Attach panels and pilasters to bracket with through sleeve tamper-proof bolts and nuts. Locate headrail joints at pilaster center lines.

G. Provide adjustment for floor variations with screw jack through steel saddles integral with pilaster. Conceal floor fastenings with pilaster shoes.

3.03 ADJUSTING

A. Perform final adjustments to leveling devices.

B. Clean exposed surfaces and touch up minor finish imperfections using materials and methods recommended by partition manufacturer.

C. Replace damaged products which cannot be satisfactorily field repaired as directed by Owner or Architect.

D. Adjust and align hardware to uniform clearance at vertical edge not exceeding 3/16 inch.

3.04 CLEANING

A. Remove protective maskings. Clean surfaces.

B. Field touch-up of scratches or damaged finish will not be permitted.

C. Replace damaged or scratched materials and with new materials.

END OF SECTION

SECTION 10522
FIRE EXTINGUISHERS, CABINETS, AND ACCESSORIES

PART 1 GENERAL

1.01 SUMMARY

A. Section Includes:
   1. Fire extinguishers.
   2. Accessories.

1.02 REFERENCES

A. American National Standards Institute/National Fire Protection Association (ANSI/NFPA):
   1. ANSI/NFPA 10 - Portable Fire Extinguishers.

B. American National Standards Institute/Underwriters' Laboratories, Inc. (ANSI/UL):
   1. ANSI/UL 711 - Rating and Fire Testing of Fire Extinguishers.

C. Underwriters Laboratories, Inc. (UL):
   1. UL 299 - Dry Chemical Fire Extinguishers.

1.03 QUALITY ASSURANCE

A. Provide units conforming to ANSI/UL requirements.

B. Regulatory Requirements: Conform to applicable code and local jurisdictional requirements of location, quantity, and type of extinguishers.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. Acceptable Manufacturers:
   1. Amerex.
   2. J.L. Industries.

B. Substitutions: Under provisions of Section 01600.

2.02 FINISHES

A. Extinguisher: Steel, enamel to red color.

PART 3 EXECUTION

3.01 EXAMINATION

A. Prior to application of substrate, verify placement of adequate blocking for support of wall mounted items.

B. Verify wall openings under provisions of Section 01600.

C. Install in locations as diirected by Fire Marshall.

END OF SECTION

APPENDX A

GEOTECHNICAL REPORT

Geotechnical Investigation

New Wilco Store
West 11th Ave & Willow Creek
Eugene, Oregon

January 28, 2019

Prepared for:

Wilco Stores

Prepared by:

EXPIRES: 12/31/2020

FEI
TESTING & INSPECTION, INC.
Geotechnical & Construction Services

FEI TESTING & INSPECTION, INC.
Geotechnical & Construction Services

Mr. Jeff Piccolo
Wilco Stores
200 Industrial Way
Mt. Angel, Oregon 97362

January 28, 2019

Re: **New Wilco Store**
West 11th Ave & Willow Creek
Eugene, Oregon

Subject: **Geotechnical Investigation**
Project No. 2187179

Dear Mr. Piccolo:

FEI Testing and Inspection, Inc. has completed the requested geotechnical investigation for the proposed new building at the vacant parcel on the south side of West 11th Ave, in Eugene, Oregon. This report includes a description of our work, a discussion of site conditions and a summary of geotechnical recommendations for design and construction of the proposed improvements. The site includes abundant fill material that is unsuitable for support of structures. Therefore, the improvements are expected to require mitigation of the upper materials as part of site grading operations. We believe the site is adequate to support the planned structure using conventional foundations, provided the site work is completed in accordance with our recommendations. Detailed recommendations for design of foundations and considerations for earthwork at the site are provided herein.

We trust this information meets your current needs. It has been a pleasure assisting you with this phase of your project. Please call if you have any questions or need additional assistance.

Sincerely,

FEI Testing and Inspection, Inc.

Mel McCracken, PE, GE
Geotechnical Engineer

Geotechnical Investigation
New Wilco Store
West 11th Ave & Willow Creek
Eugene, Oregon

PROJECT INFORMATION

A new retail store is being planned at a currently vacant parcel on south side of West 11th Avenue, in Eugene, Oregon. The site location is shown on the Site Plan (Figure 1), included in Appendix A. The parcel is slightly sloping down to the north with grass and trees cover the surface over most of the improvement area. Development at the parcel is expected to include 38,000 sq.ft. single story masonry framed structure constructed on a slab-on-slab grade with an exterior garden center and storage yard. Additionally, it is our understanding that site improvements and new pavement areas are also planned in conjunction with the building construction. Site grading is expected to be relatively minor with the finished floor level close to existing grades with grades sloped away from the building.

FEI Testing and Inspection is providing geotechnical engineering services at the request of Wilco Stores for the proposed improvements. Our work has included observation of subsurface exploration, geotechnical analysis work and preparation of this summary report.

FIELD EXPLORATION

The field exploration focused on characterization of the upper soils at the site that will be involved in the proposed foundation excavations. We visited the site on December 13, 2018 to observe subsurface explorations. During our visit we conducted a brief surface reconnaissance of the proposed development area. The subsurface exploration included digging six test pits using a rubber tired backhoe. The approximate locations of the test pits are shown on the attached Site Plan (Figure 1, Appendix A). The test pits were advanced to a maximum depth of ±9.5 feet. The soil profiles in each test pit were logged and samples were collected from some locations. The test pits were backfilled with excavated material and the surface graded relatively smooth. The soil profiles are summarized on the narrative test pit logs attached in Appendix B. Our surface and subsurface observations are summarized in the following sections.

SITE CONDITIONS

Surface Conditions:

The site is in an area of slightly sloping terrain. The grades across the development area varies and includes relatively level to slightly sloping terrain. The surface of the parcel is generally grass covered, with areas of trees.

Subsurface Conditions:

Subsurface conditions were evaluated using the test pit explorations. The approximate test pit locations are shown on the Site Plan (Figure 1, Appendix A). Slight ground water infiltration was observed at the base of the excavation at TP-4 and TP-5. We anticipate that shallow perched water is present at the site during later winter and spring months. Subsurface conditions observed at the site as part of our field exploration typically included the following strata:

FILL.

The exploration encountered fill material in the upper portion of all the test pit locations. The composition of the fill varies with location and includes high plastic clay, gravel, construction debris and concentrated organics. The fill depths vary from 4.5 to greater than 6 feet below existing grades. The fill depth at test pit TP-6 is limited to the upper 2 feet of the soil profile.

Topsoil.

The upper native soils typically consist of clay that contains some silt and organics. The clay is typically black, soft, and has high plasticity. The thickness of the topsoil layer is typically limited to ±0.5 to 2 feet.

Clay.

The topsoil is typically underlain by soft to stiff clay with variable silt and sand. The clay varies from grey to tan and is moist to very moist and has high plasticity.

Decomposed Sandstone.

Some locations include stiff clay and sand that represent decomposed sandstone. The decomposed sandstone is typically yellow to grey, moist, with medium plasticity clay. The amount of sand varies and typically includes some cementation.

Laboratory Testing:

Laboratory testing was completed on selected samples from the field exploration. Atterberg Limits testing on several samples of the clay were completed to assist in classification (Figure 3, Appendix A) and suggests that the clay has high plasticity.

DISCUSION OF GEOTECHNICAL ISSUES

Weather Conditions:

We have assumed that site preparation work will occur during dry weather months. The weather conditions are expected to have significant impacts on the site preparation work since the upper soils throughout the site consist of high plastic clay. Wet weather work is expected to require deeper excavation depths and a greater thickness and higher quality of imported crushed rock to support construction access, the new building pad and foundation construction. We should be notified if wet weather construction is required at the site.

Site Grading and Building Pad:

The proposed improvements will require significant site grading to mitigate the existing deep fill that is present across the improvement area. All the existing fill material will need to be removed from beneath the building pad and new foundation areas. Permanent cuts and fills at the site are expected to generally be less than 2 feet. We anticipate that the finished floor of the buildings will be constructed near or slightly above current site grades.

We have assumed that the grading for the paved access and parking areas where settlement is not as great of a concern would not fully mitigate the existing fill. Therefore, we have assumed that moisture conditioning and compaction of the existing fill materials will be completed to support the pavements. A relatively thick granular fill section will be required over the high plastic clay soils. In addition, some areas of deeper excavation will be required if unsuitable materials are encountered at the subgrade level.

Foundations:

The proposed structures are expected to be supported by shallow foundations constructed over the high plastic clay and structural fill. We anticipate that the granular fill beneath the building pad will typically be 4 to 6 feet thick. Based on the required depth of excavation and granular fill, the excavation and fill placement will need to extend 5 feet beyond the limits of the new building pad and foundation areas. A typical section of the required building pad and foundation preparation is shown on Figure 2 attached in Appendix A. The high plastic clay soils are expected to have moderate to high shrink/swell potential with variations in moisture content. Therefore, the moisture of the clay should be maintained throughout the work. We anticipate that due to the depth of granular fill required at the site, the deeper clay will experience only minor seasonal moisture changes. Therefore, we do not expect shrink/swell movements will be a significant issue for the new building pad.

Drainage:

The site improvements should include drainage considerations. We understand that roof drains will be connected to the storm system and that much of the building exterior will be paved. We have assumed that the new building will be elevated and backfill will be sloped to promote surface drainage away from the structure. The high plastic clay soils are expected to have poor permeability. Therefore, surface water is expected to perch on the upper soils across the site.

GEOTECHNICAL ANALYSIS

FEI Testing and Inspection has conducted geotechnical analysis of the foundation soils for design of the new foundations. Our work is briefly summarized below.

Seismic Design:

The average soil conditions in the upper ±100 feet beneath the proposed development area are expected to include medium dense alluvium. Therefore, we believe that use of a site class D is appropriate for seismic design. In our opinion, the spectral accelerations and attenuation relationships provided in the 2014 OSSC are appropriate for seismic design of the new structure. We recommend using the General Procedure of OSSC, Section 1613 to develop parameters for seismic design of the structure.

Peak ground accelerations and spectral accelerations (on rock) were determined for design using 2% probability of exceedance in 50 years (i.e., ±2,475 year return interval). The USGS modeling considers a variety of seismic sources including crustal and subduction zone earthquakes. However, the principal sources of the design ground motion is due to a large magnitude (M_w 8.3 to 9.0) earthquake along the Cascadia Subduction Zone along the Pacific coast and a shallow crustal earthquake. The 2014 OSSC design parameters are summarized in Table. 1.

Table 1. Seismic Design Parameters

Site Class	S_S	S_1	S_{MS}	S_{M1}	S_{DS}	S_{D1}
D	0.82	0.43	0.96	0.67	0.64	0.45

Bearing Capacity:

We conducted bearing capacity analysis for the anticipated foundation loads for the new structure. We understand that the loads for the structure will be light to moderate and may be as great as 5 kips/linear foot for continuous footings and 100 kips for column footings.

The footings may be constructed over structural fill constructed over the native clay using an allowable bearing pressure of 2,500 psf. The bearing pressure may be increased to 3,000 psf when considering short-term (i.e., wind or seismic) loads. All continuous footings should have a minimum width of 16 inches. Isolated spread footing foundations should have a minimum dimension of 18 inches. Our analysis assumed that all footings would be underlain by a minimum of ±12 inches of compacted crushed rock that extends a minimum of 12 inches beyond the limits of the footing. The base of all footings should be embedded 1.5 feet below finished grades.

The footings should be designed using an ultimate subgrade friction coefficient of 0.35 for foundations constructed on compacted crushed rock. A factor of safety of 1.5 is appropriate for this coefficient to minimize relative movements when considering long-term loads. Passive pressures against the sides of the footings may be estimated using an equivalent fluid density of 300 pcf assuming the footings will be backfilled with compacted granular fill.

Settlement:

Settlement analysis was completed for the anticipated footings based on the typical soil profile. Our analysis considered the assumed foundation loads over spread and continuous footings constructed over compacted granular fill over the native clay subgrade. We have assumed that all existing fill materials at the site will be mitigated by removal and replacement with compacted aggregate base. Our analysis suggests that maximum post-construction settlements of ¾ inch should be assumed for the new foundations.

Pavements:

We conducted pavement thickness analysis for the parking lot pavements that will support limited truck traffic. We estimated a daily traffic of 200 cars and light pickups, 4 small trucks (24,000 lbs. gross vehicle weight) and 3 medium trucks (48,000 lbs. gross vehicle weight) for the access pavements. A M_r value of 3,000 psi was selected for our analysis assuming that subgrade soils would consist of stable, compacted soils that will include some plastic clay. We assumed a 20-year design life for our analysis, a reliability of 90% and terminal serviceability of 2.2. Our calculations suggest that a pavement section consisting of 4 inches of asphalt over 8 inches of aggregate base over 18 inches of granular subbase should be used in areas of flexible pavements supporting truck traffic. The asphalt section may be reduced to 3 inches in areas limited to car parking. The granular subbase thickness may also be able to be decreased to 12 inches for area that will not need to support construction equipment or staging.

It should be noted that the subgrade at the site will likely be variable. Therefore, deeper excavation and replacement with compacted granular fill is expected to be required in some areas. The clay subgrade soils will be sensitive to softening during wet weather, particularly under heavy construction traffic. Therefore, if the construction schedule is unable to accommodate paving by the end of October, we recommend that a thicker base and subbase section and a separation geotextile be used to accommodate limited construction traffic into the fall months.

GEOTECHNICAL RECOMMENDATIONS

Based on our observations of the soils and our understanding of the proposed development FEI Testing and Inspection believes that it will be practical to construct the improvements using conventional construction techniques. Geotechnical recommendations are provided in the following sections.

Materials:

1. Aggregate base as defined in this report should consist of ¾ or 1-inch minus, well graded crushed rock. The rock should be relatively clean with less than 5% (by weight) passing the #200 sieve.

2. Stabilization rock, if required, should consist of clean, angular, 3-inch crushed rock. Stabilization rock should contain less than 2% (by weight) passing the #200 sieve.
3. Granular fill should consist of relatively clean mixtures of sand and gravel with some silt. We anticipate that bar-run or pit-run gravels may be used as granular fill to support the improvements. The granular fill should not contain organics or plastic clay.
4. Compact all granular fill, aggregate base and stabilization rock to 95% relative compaction. The maximum dry density of ASTM D 698 should be used as the standard for evaluation of relative compaction. Placement and compaction of structural fill should be completed using loose lifts no greater than 12 inches thick, unless specified otherwise. Field density testing and observation of placement and compaction procedure should be conducted on all structural fill to document proper compaction at regular intervals throughout the work.
5. Subgrade beneath foundations, pavements and the building pad should be evaluated and approved by the engineer prior to placement of structural fill or aggregate base. Deeper excavation is expected at isolated locations to remove test pit backfill. Subgrade conditions should be visually confirmed by the engineer during the work. Wet weather construction may require more frequent evaluation of subgrade conditions encountered as the work progresses.
6. Provide shoring for all trench excavations greater than 4 feet below grade. Anticipate that caving of trench sidewalls may occur, even in shallow excavations, particularly in wet weather.

Foundation Design:

7. Design all moderately loaded foundations (continuous wall footings and isolated column footings) using an allowable bearing capacity of 2,500 psf. The bearing capacity may be increased to a maximum of 3,000 psf when considering short-term (i.e., wind or seismic) loads. This evaluation assumes that footing preparation and placement of compacted aggregate base will be conducted as recommended.
8. Provide a minimum footing width of 16 inches for continuous footings and 18 inches for isolated column footings. Place the base of all footings at least 1.5 feet below the finished grade or paved surfaces.
9. Provide a minimum of 12 inches of compacted aggregate base beneath the footings that extends laterally 12 inches beyond the footing limits.

Building Foundation/Slab Construction:

Recommendations for building site preparation conducted during dry weather months are provided below.

10. Excavate the upper fill and soft topsoil beneath the building pad extending laterally at least 5 feet beyond all foundations. Haul the excavated materials from the site. Maintain the moisture of the subgrade soils throughout the work.
11. Evaluation of the subgrade soils and documentation of all structural fill will be required throughout the work. Granular fill is expected to require documentation of the compaction procedure and regular proof rolling using a loaded 12 cubic yard dump truck. Field density testing should be completed at regular intervals on compacted aggregate base to document the compaction.
12. Structural fill should be placed in loose lifts no greater than 12 inches thick, unless otherwise noted. Each lift should be moisture conditioned to near optimum moisture content and compacted using multiple passes of a large, vibratory roller.
13. The building pad is expected to consist of 4 to 6 feet of imported granular fill to support the improvements. The granular fill should be capped with 12 inches of aggregate base to support the foundations and slabs.
14. The aggregate base should be compacted using vibratory compaction equipment in lifts no greater than 12 inches thick. Thinner lifts may be required if smaller compaction equipment is used. Compact the aggregate base to 95% relative compaction according to ASTM D 698. All structural fill should be documented at regular intervals throughout the placement and compaction. Periodic field density testing should be completed to confirm adequate compaction of the aggregate base.
15. The floor coverings for the slab on grade may have specific moisture requirements. Therefore, a vapor barrier may be required beneath the slab to accommodate the proposed floor covering or curing system.

Pavement Construction:

16. Pavement subgrade soils are moisture sensitive and will susceptible to softening and pumping during wet weather conditions. Therefore, the subgrade should be protected from construction traffic throughout the work.
17. Excavate the pavement areas to the design subgrade. We have assumed that the new pavement areas will include moisture conditioning and compaction of the upper 12 inches of the existing fill. The fill may include areas of soft or unsuitable subgrade that require deeper excavation depths. Compaction of on-site soil will require scarification and moisture conditioning of the soil to near optimum moisture content. Efficient compaction will require use of a pad foot or kneading compactor. The subgrade surface should be firm, and smooth prior to placement of aggregate base. Use of a separation geotextile should also be anticipated.
18. Proof roll the prepared subgrade during dry weather conditions immediately prior to placement of aggregate base using a loaded 12 cubic yard dump truck. Areas of excessive deflection or rutting should be identified and excavated and replaced with aggregate base.

19. A nominal thickness of 18 inches of compacted granular fill should be used over the approved subgrade soils for pavement areas. Use of a thicker section of granular fill will be required in areas of deeper soft or unsuitable fill material. We have assumed that the granular fill will be capped with 8 inches of aggregate base. If the base is expected to support construction traffic during late fall months a thicker section should be considered. We recommend that the anticipated construction schedule and required base section be reevaluated once the construction schedule is known.
20. Proof roll the compacted aggregate base immediately prior to paving to identify any areas of soft subgrade or contaminated base aggregate. The proof rolling should be completed using a loaded 12 cubic yard dump truck and any areas of excessive deflection or pumping should be identified. Any unstable areas should be excavated to depths as necessary to remove the soft subgrade and replaced with imported aggregate base.
21. Provide a minimum asphalt section of 4 inches for primary ingress/egress areas and truck routes. Parking areas limited to car traffic only may include a reduced asphalt thickness of 3 inches.

LIMITATIONS OF THIS REPORT

The analysis, conclusions and recommendations contained herein assume that the soil conditions and absence of ground water encountered in the test pits are representative of overall site conditions. Additional geotechnical design and construction recommendations may be required during final design or construction of the improvements. The above recommendations assume that we will be present during construction to confirm the assumed foundation and subgrade conditions. We will assume no responsibility or liability for any engineering judgment, inspection or testing performed by others.

Our work was performed for the exclusive use by Wilco Stores and their design consultants for the proposed new Wilco Store at West 11th Avenue and Willow Creek, in Eugene, Oregon. FEI Testing and Inspection, Inc. performed our work in accordance with generally accepted professional geotechnical engineering practices in similar locations. Our services do not include any survey or assessment of potential contamination or contamination of the soil or ground water by hazardous or toxic substances. No other warranty, expressed or implied, is made.

Geotechnical Investigation

New Wilco Store
West 11th Ave & Willow Creek
Eugene, Oregon

Appendix A

Figures

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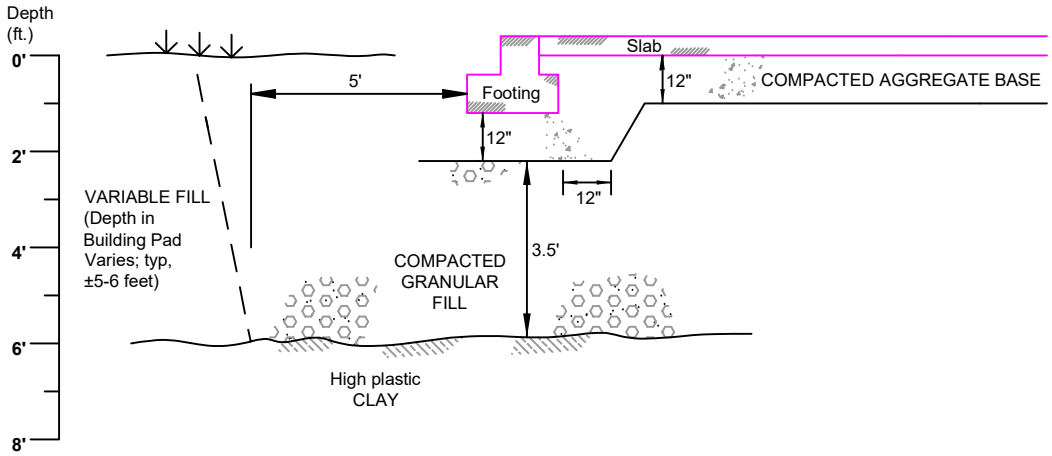
Figure 1. Site Plan

Wilco Stores
West 11th Ave & Willow Creek
Eugene, Oregon

BUILDING PAD - GEOTECHNICAL SECTION



FEI
TESTING & INSPECTION, INC.
Geotechnical & Construction Services
Corvallis (541) 757-4698
Eugene (541) 684-3849

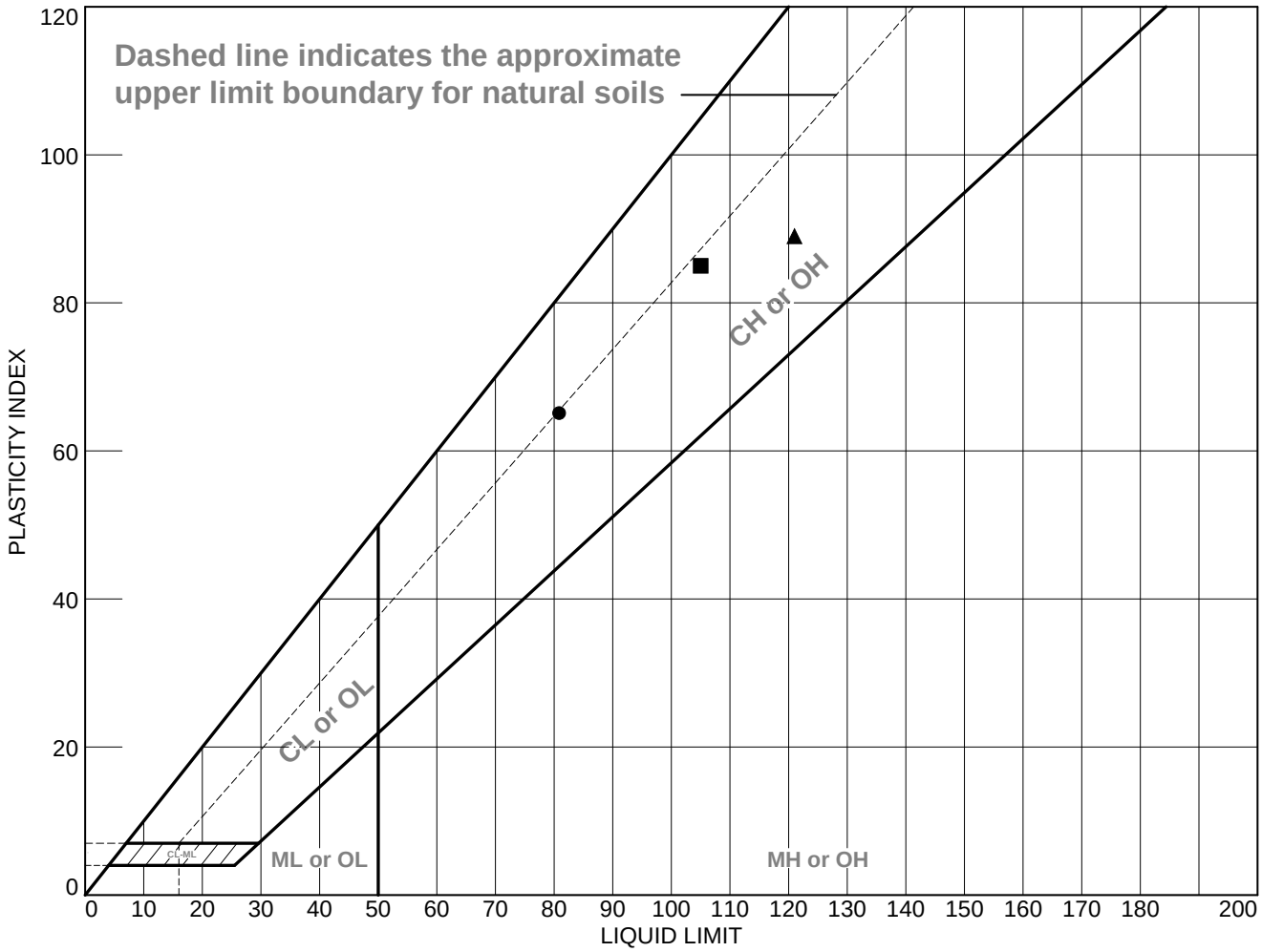
GEOTECHNICAL SECTION

New Wilco Store

West 11th Ave & Willow Creek
Eugene, Oregon

Figure 2

LIQUID AND PLASTIC LIMITS TEST REPORT



SOIL DATA

SYMBOL	SOURCE	SAMPLE NO.	DEPTH	NATURAL WATER CONTENT (%)	PLASTIC LIMIT (%)	LIQUID LIMIT (%)	PLASTICITY INDEX (%)	USCS
●	7430	TP-3	6.0'	24.8	16	81	65	CH
■	7430	TP-4	7.5'	36.7	20	105	85	CH
▲	7430	TP-6	2.0'	43.8	32	121	89	CH

FEI Testing & Inspection, Inc.

Corvallis, OR

Client: Wilco Stores

Project: Wilco Stores - W 11th Ave and Willow Creek

Project No.: 2187179

Figure 3

Geotechnical Investigation

New Wilco Store
West 11th Ave & Willow Creek
Eugene, Oregon

Appendix B

Test Pit Logs

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Geotechnical Investigation
New Wilco Store
West 11th Ave & Willow Creek
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APPENDIX B
NARRATIVE TEST PIT SUMMARIES

Logged on December 13, 2018

Test Pit: **TP-1**

Depth (feet)	Material Description	Notes/Sampling
0 to 4.5	Soft clay, silt, sand, and gravel with some debris; brown, moist, gravel includes rounded gravel and weathered rock fragments, debris includes asphalt, concrete and wood pieces, (variable fill).	S-1-1 @1.5’
4.5 to 5.0	Soft CLAY with some silt and organics; dark grey to black, very moist, (probable topsoil).	S-1-2 @ 5.0’
5.0 to 7.0	Soft CLAY; dark grey, very moist, high plasticity.	No groundwater infiltration noted.

Test Pit: **TP-2**

Depth (feet)	Material Description	Notes/Sampling
0 to 3.0	Soft clay, silt, sand, and gravel with some debris; brown, moist, gravel includes rounded to weathered rock fragments, debris includes asphalt pieces, (variable fill).	
3.0 to 6.0	Soft clay with trace sand and asphalt chunks; brown, very moist, high plasticity clay, (fill).	
6.0 to 6.5	Soft CLAY with some silt, trace organics; dark grey to black, very moist, high plasticity, (topsoil).	S-2-1@ 6.5’
6.0 to 7.0+	Soft CLAY with trace sand; grey, very moist, high plasticity.	No groundwater infiltration noted.

Test Pit: **TP-3**

Depth (feet)	Material Description	Notes/Sampling
0 to 1.5	Soft clay, silt, sand, occasional gravel; brown, moist, (variable fill).	
1.5 to 3.0	Soft peat/humus with occasional rock fragments; black, damp, fine roots, (organic fill).	S-3-1 @ 1.5’
3.0 to 4.0	Soft to medium stiff clay with some sand; light grey, moist, medium plasticity, fine roots and occasional decomposed sandstone fragments, (fill).	S-3-2 @ 3.0’
4.0 to 6.0	Medium dense sandy SILT with trace clay; light grey brown, damp, scattered small roots, (fill).	S-3-3 @ 4.0’
6.0 to 8.0	Stiff CLAY with trace sand; greenish grey, moist, high plasticity, (topsoil).	S-3-4 @ 6.0’
8.0 to 9.0	Dense SAND with clay; light grey brown, very moist, medium to fine sand, some fragments with moderate cementation (decomposed sandstone).	S-3-5 @ 8.0’ No groundwater infiltration noted.

Test Pit: **TP-4**

Depth (feet)	Material Description	Notes/Sampling
0 to 3.0	Loose sandy gravel with trace silt and clay over geotextile fabric, (fill).	
3.0 to 5.0	Soft clay with trace sand and organics; brown, moist to very moist, high plasticity clay, fine roots, (fill).	
5.0 to 7.5	Soft to medium stiff CLAY with some sand; brown-green, very moist, high plasticity, (possible fill).	S-4-1 @ 5.0’
7.5 to 9.5+	Stiff CLAY; greenish grey, very moist, high plasticity.	S-4-2 @ 7.5’ Slight groundwater seepage @ 9.5’

Test Pit: **TP-5**

Depth (feet)	Material Description	Notes/Sampling
0 to 1.5	Soft CLAY with some silt, organics, and trace gravel; brown, moist, rounded gravel, fine roots, (fill).	
1.5 to 2.5	Soft, sandy CLAY with some gravel; multicolored, moist, (fill).	
2.5 to 4.0	Medium dense sandy SILT with trace clay; light grey brown, damp, fine roots, (fill)	S-5-1 @ 3.0’
4.0 to 6.5	Stiff CLAY with trace sand; greenish gray, moist, high plasticity.	S-5-2 @ 4.0’
6.5 to 8.5	Stiff CLAY with trace fine sand; greyish tan, moist, medium to high plasticity.	S-5-3 @ 6.5’
8.5 to 9.5+	Very stiff CLAY with some fine sand; yellow tan, medium plasticity, (decomposed sandstone).	S-5-4 @ 8.5’ Slight groundwater seepage @ 9.5’

Test Pit: **TP-6**

Depth (feet)	Material Description	Notes/Sampling
0 to 1.0	Soft silt with some clay, trace gravel and organics; brown, moist, rounded gravel, fine roots, (fill).	
1.0 to 2.0	Stiff CLAY with some silt and trace sand, and organics; brown, moist, (probable fill).	
2.0 to 4.0	Soft CLAY with some sand; yellowish grey, very moist, medium to fine sand, high plasticity.	S-6-1 @ 2.0’
4.0 to 8.0+	Stiff CLAY with some sand; yellow tan, moist, medium plasticity, fine sand, becoming sandier with depth, (decomposed sandstone).	S-6-2 @ 5.0’ No groundwater infiltration noted.