Project Specifications

For

Riviera Beach Community Redevelopment Agency

2001 Broadway Ave
Suite 300
Riviera Beach, Florida 33404

Marina Village
Seawall Removal and Replacement
Bid Documents
March 14, 2018

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S+A PROJECT NO. 18026
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S+A Project No. 11007/12055
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Division 31 – EARTHWORK

Division 32 – EXTERIOR IMPROVMENTS
SECTION 01 11 00 - SUMMARY OF WORK

PART 1 GENERAL

1.1 WORK COVERED BY CONTRACT DOCUMENTS

A.) The Marina Village (MV) redevelopment site is bounded by Ave “E” on the west, the Inter-coastal Waterway and Peanut Island on the east, 11th Street on the south and 16th Street on the north. Minor elements of transportation and facility improvements lie outside the previously noted boundaries and the public Riviera Beach Marina lies at the east of the site. Currently the site is approximately 28 acres and the Phase I of the MV included the Marina Event Center (MEC), the renovated Bicentennial Park, the Marina, small waterfront businesses and services and a small Tiki Bar on the east side of the MEC.

The Marina is currently being redeveloped into a state of the art facility. It is a regional destination for diving, fishing and other waterfront activities. The proposed design is intended to enhance these existing assets with the new development to transform the Marina into a world class facility.

The MV Phase I redevelopment included improvements to Bicentennial Park, a new Boardwalk/ Promenade and Plaza, the addition of New Streets and Sidewalks, Extensive Utility Improvements, Temporary Surface Parking for approximately 700 Vehicles, a Beach Front Pavilion/Stage and the Marina Event Center. Some private development is planned for this phase. The basis for the design of all the improvements is the approved Master Plan in conjunction with dialogue between the City, the CRA and the Owner’s representative Gilbane, and the Master Developer. The Joint Work Team (JWT) includes the City, the CRA, the Song + Associates Team, EDSA, Andrew Morgan Services, Calvin Giordano Associates Civil Engineers TLC Engineers and Land Development Consortium) and the Master Developer’s Master Planners; Elkus-Manfredi Architects and Sasaki Associates.

B.) The Sea Wall

An element included in the Phase I construction was not considered in the approved Master Plan is the sea wall. This feature runs from the north and south boundaries of the project and was required to be added to the project to meet future FEMA requirements. This wall is intended to protect the development from weather systems that may cause flooding which could potentially damage the site. Features proposed to be included in its construction are ramps, stairs and planters. The grade elevations were revised to accommodate the future FEMA requirements. The basic revised grade elevations for the site are 9'-0" above sea level. The finish floor level of the Marina Event Center is 10'-0" and the top of the sea wall is proposed to be 11'-0" above sea level.

Following installation of the seawall FEMA was ordered to delete this requirement. The majority of the community perceived the seawall as feature that suppressed the experience of the marina’s water front. Once the FEMA regulation was removed the City and the decided to have the feature demolished and install non obstructive guard rails, required by the Florida Building Code.

1.2 WORK SEQUENCE

A) Coordinate, sequence, and stage new work in accordance with approved Construction Schedules and safety plan.

B) Coordinate access, parking, and egress of all Contractor Personnel prior to commencing construction.
C) Construct Work in stages to provide for public and Owner’s safety at all times including coordination with the local Fire Department for approval of ingress/egress with construction fencing.
D) Working Hours shall be in accordance with the applicable City Ordinances and / or in compliance with the Owner's directions.

1.3 CONTRACTOR USE OF PREMISES

A) Confine operations at site to areas permitted by Law, Ordinances, Permits, and Contract Documents.
B) Do not unreasonably encumber site with materials or equipment.

1.4 SITE RESTRICTIONS AND REQUIREMENTS FOR ALL PROJECTS

A) The designated superintendent/foreman shall sign in and out all workmen on a daily basis.
   1) All visitors to the site shall sign in on the Site Visitors Log kept in the Construction Manager Construction Office trailer or other designated location.
B) Report all construction site accidents to the Project Riviera Beach CRA Facility Manager the same day they occur.
   1) Provide copies of accident reports and police reports to the Project Riviera Beach CRA Facility Manager the day they occur.
C) All Contractors, Subcontractors, and other construction employees shall park their vehicles in the designated construction site staging area, as shown on plans.
   1) The staging area shown on the drawings is conceptual and modifications coordinated with Riviera Beach CRA staff, as necessary.
D) No firearms or other weapons allowed on the site.
E) No Smoking in buildings at MV.
F) No alcohol or drugs on MV.
G) No animals may be brought or kept on the site.

1.5 VISITOR OCCUPIED MARINA SPECIAL REQUIREMENTS

A) Project personnel shall not communicate with students, except to warn of danger to order off out of the construction site.
B) Project personnel shall not enter other occupied areas on campus, except in emergencies or with the permission and knowledge of the Riviera Beach CRA staff and the Riviera Beach CRA construction project representative.
C) NO SMOKING, ALCOHOL, or non-Prescription DRUGS on any part of the Marina Village property, whether the school is in session or not.
D) No firearms or other weapons allowed on the site.
E) The use of radios, tape and C.D. players is limited to the contractor’s trailer and unoccupied areas of the marina, and keep the volume level to prevent being heard at the places where the active visitors are congregating or neighboring properties.
F) Project personnel shall wear appropriate clothing, shall not have any foul or vulgar language visible on the clothing.
G) Project personnel shall not use foul or vulgar language while students and staff are on campus.
H) No animals may be brought or kept on the site.

1.6 DAILY LOG

A) The Contractor shall keep a daily log of the construction progress and include the construction site equipment utilized each day.
B) Provide one copy to the RB CRA Project Manager daily.

1.7 ITEMS NOT IN CONTRACT
A) Items under this contract include all work indicated on the contract documents, unless specifically noted as "Not In Contract" (N.I.C.).

1.8 DEFINITIONS

A) Definitions pertaining to sustainable development: As defined in ASTM E2114 and as specified herein.
B) Deconstruction: Disassembly of buildings for the purpose of recovering materials.
C) DfE (Design for the Environment): A technique that includes elements of resource conservation and pollution prevention as applied in various product sectors. A technique that incorporates approaches which are part of product (or assembly) concept, need and design. Considerations involve material selection, material and energy efficiency, reuse, maintainability and design for disassembly and recyclability.
D) Non-Renewable Resource: A resource that exists in a fixed amount that cannot be replenished on a human time scale. Non-renewable resources have the potential for renewal only by geological, physical, and chemical processes taking place over millions of years. Examples include iron ore, coal, and oil.
E) Perpetual Resource: A resource that is virtually inexhaustible on a human time scale. Examples include solar energy and wind energy.
F) Recycled Content Materials: Product that contain pre-consumer or post-consumer materials as all or part of their feedstock. Recycled content claim shall be consistent with the Federal Trade Commission (FTC) Guide for the Use of Environmental Marketing Claims.
G) Stewardship: Responsible use and management of resources in support of sustainability.
H) Sustainability: The maintenance of ecosystem components and function for future generations.

1.9 ENVIRONMENTAL GOALS

A) General: The goal is to produce a beautiful, sustainable, cost-effective buildings that meets the building's functional program and promotes productivity.
   1) Resource Management: Promote stewardship of the earth’s resources. The earth’s resources include: perpetual resources, renewable resources, and non-renewable resources.
      (a) Preserve or renew biodiversity and ecosystems.
      (b) Maximize use of bio-based, energy efficient, water efficient, rapidly renewable, and recycled content resources.
      (c) Maintain or improve water quality and promote water stewardship.
      (d) Employ job-site recycling and salvage procedures.
      (e) Employ sustainable design principles and DfE methodologies.
      (f) Preserve non-renewable resources.
      (g) Minimize life cycle energy costs through a whole building approach that may include: daylighting, passive solar heating and cooling, energy efficient systems, and renewable energy systems.
   2) Toxicity/IEQ: Promote good indoor environmental quality (IEQ). Aspects of IEQ include: light quality, acoustic quality, thermal comfort, and air quality.
      (a) Maximize use of non-toxic, non-hazardous, healthy and safe building materials.
SECTIONS 01 23 00 - ALTERNATES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Section includes administrative and procedural requirements for alternates.

1.3 DEFINITIONS

A. Alternate: An amount proposed by bidders and stated on the Bid Form for certain work defined in the bidding requirements that may be added to or deducted from the base bid amount if Owner decides to accept a corresponding change either in the amount of construction to be completed or in the products, materials, equipment, systems, or installation methods described in the Contract Documents.

1. Alternates described in this Section are part of the Work only if enumerated in the Agreement.

2. The cost or credit for each alternate is the net addition to or deduction from the Contract Sum to incorporate alternate into the Work. No other adjustments are made to the Contract Sum.

1.4 PROCEDURES

A. Coordination: Revise or adjust affected adjacent work as necessary to completely integrate work of the alternate into Project.

1. Include as part of each alternate, miscellaneous devices, accessory objects, and similar items incidental to or required for a complete installation whether or not indicated as part of alternate.

B. Notification: Immediately following award of the Contract, notify each party involved, in writing, of the status of each alternate. Indicate if alternates have been accepted, rejected, or deferred for later consideration. Include a complete description of negotiated revisions to alternates.

C. Execute accepted alternates under the same conditions as other work of the Contract.
D. Schedule: A schedule of alternates is included at the end of this Section. Specification Sections referenced in schedule contain requirements for materials necessary to achieve the work described under each alternate.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION

3.1 SCHEDULE OF ALTERNATES

A. Alternate No. 1:
   1. Add Alternate: Stainless Steel Cable Railing as indicated in the Bid Documents and as specified in Section 05 72 00.

B. Alternate No. 2:
   1. Add Alternate: Decorative Metal Railing as indicated in the Bid Documents and as specified in Section 05 73 00.

END OF SECTION 012300
SECTION 01 31 00 - PROJECT MANAGEMENT AND COORDINATION

PART 1  GENERAL

1.1  SECTION INCLUDES:

A. Coordination and project conditions
B. Field engineering
C. Preconstruction meeting
D. Site mobilization meeting
E. Progress meetings
F. Pre-installation meetings
G. Equipment electrical characteristics and components
H. Alteration project procedures

1.2  COORDINATION AND PROJECT CONDITIONS

A. Coordinate the scheduling, submittals, and Work of the Project Manual to ensure efficient and orderly sequence of installation of interdependent construction elements, with provisions for accommodating items installed later.
B. Verify utility requirements and characteristics of operating equipment are compatible with building utilities.
   1. Coordinate work of various sections having interdependent responsibilities for installing, connecting to, and placing in service, such equipment.
C. Coordinate space requirements, supports and installation of mechanical and electrical work as indicated diagrammatically on Drawings.
   1. Follow routing shown for pipes, ducts, and conduit, as closely as practicable; place runs parallel with line of building.
   2. Utilize spaces efficiently to maximize accessibility for other installations, for maintenance, and for repairs.
D. In finished areas, except as otherwise indicated, conceal pipes, ducts, and wiring within the construction.
   1. Coordinate locations of fixtures and outlets with finish elements.
E. Coordinate completion and clean up of Work of separate sections in preparation for Substantial Completion and for portions of Work designated for Owner's partial occupancy.
F. 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.
G. Owner will not consider change orders for extra work required by the Contractor due to poor coordination by the Contractor.

1.3  FIELD ENGINEERING

A. Employ a Land Surveyor registered in the State of Florida and acceptable to the Architect and Owner.
B. Contractor shall locate and protect survey control and reference points.
C. Control datum for survey is that established by Owner provided survey.
D. Verify setbacks and easements; confirm drawing dimensions and elevations.
E. Provide field engineering services.
   1. Establish elevations, lines, and levels, utilizing recognized engineering survey practices.
F. Submit a copy of site drawing and certificate signed by the Land Surveyor that the elevations and locations of the Work are in conformance with the Contract Documents.

1.4 PRECONSTRUCTION MEETING

   A. Schedule a conference after Notice to Proceed.
   B. Attendance Required: Owner, Architect, Commissioning Authority, and Contractor.
   C. Agenda:
      1. Execution of Owner-Contractor Agreement, if not executed.
      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.
      6. Procedures and processing of field decisions, submittals, substitutions, applications for payments, proposal request, Change Orders and Contract closeout procedures.
      7. Scheduling
      8. Scheduling activities of a Geotechnical Engineer
      9. Issuance of Notice to Proceed
      10. Overview of Commissioning requirements
   D. Record minutes and distribute copies within two days after meeting to participants, with copies to Architect, Owner, participants, and those affected by decisions made.

1.5 SITE MOBILIZATION MEETING

   A. Schedule a meeting at the Project site prior to Contractor occupancy.
   B. Attendance Required: Owner, Architect, Special Consultants, Commissioning Authority, Specialty Contractors, and Contractor, Contractor's Superintendent, and major Subcontractors.
   C. Agenda:
      1. Use of premises by Owner and Contractor.
      2. Owner's requirements and partial occupancy.
      3. Construction facilities and controls provided by Owner.
      4. Temporary utilities provided by Owner.
      5. Survey and building layout.
      7. Schedules
      8. Application for payment procedures.
      9. Procedures for testing and commissioning.
     11. Requirements for start-up of equipment.
     12. Inspection and acceptance of equipment put into service during construction period.
   D. Record minutes and distribute copies within two days after meeting to participants, with copies to Architect, Owner, participants, and those affected by decisions made.

1.6 PROGRESS MEETINGS

   A. Schedule and administer meetings throughout progress of the work at maximum monthly intervals.
   B. Make arrangements for meetings, prepare agenda with copies for participants, and preside at meetings.
   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 that 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.
14. Commissioning related issues (at designated meetings).

E. Record minutes and distribute copies within two days after meeting to participants, with copies to Architect, Owner, participants, and those affected by decisions made.

1.7 PREINSTALLATION MEETING

A. When required in individual specification section, convene a pre-installation meeting at the site prior to commencing work of the section.
B. Require attendance of parties directly affecting, or affected by, work of the specific section.
C. Notify Owner, Commissioning Authority, and Architect five working days in advance of meeting date.
D. Prepare agenda and preside at meeting:
   1. Review conditions of installation, preparation and installation procedures.
   2. Review coordination with related work.
E. Record minutes and distribute copies within two days after meeting to participants, with copies to Architect, Owner, participants, and those affected by decisions made.

PART 2 PRODUCTS

2.1 NOT USED

PART 3 EXECUTION

3.1 ALTERATION PROJECT PROCEDURES

A. Materials: As specified in Product sections; match existing Products and work for patching and extending work.
B. Employ skilled and experienced installer to perform alteration work.
C. Close openings in exterior surfaces to protect existing work from weather and extremes of temperature and humidity.
D. Remove, cut and patch Work in a manner to minimize damage and to provide means of restoring Products and finishes to original or specified condition.
E. Refinish existing visible surfaces to remain in renovated rooms and spaces, to specified condition for each material, with a neat transition to adjacent finishes.
F. Where new Work abuts or aligns with existing, provide a smooth and even transition.
   1. Patch Work to match existing adjacent Work in texture and appearance.
G. When finished surfaces are cut so that a smooth transition with new Work is not possible, terminate existing surface along a straight line at a natural line of division and submit recommendation to the Architect for review.
H. Where a change of plane of 1/4" or more occurs, submit recommendation for providing a smooth transition to Architect for review.
I. Patch or replace portions of existing surfaces, damaged, lifted, discolored, or showing other imperfections.

J. Finish surfaces as specified in individual Product sections.

END OF SECTION
SECTION 01 32 00 – CONSTRUCTION PROGRESS DOCUMENTATION

PART 1 GENERAL

1.1 SECTION INCLUDES:

A. References
B. Quality Assurance
C. Format
D. Schedules
E. Submittals
F. Review and evaluation
G. Updating schedules
H. Distribution

1.2 REFERENCES


1.3 QUALITY ASSURANCE

A. Scheduler:
   1. Contractor's personnel specializing in CPM scheduling with minimum of five years experience in scheduling construction work of a complexity comparable to this Project.
   2. Having use of computer facilities capable of delivering a detailed graphic printout within 48 hours of request.
B. Contractor's Administrative Personnel: Five years minimum experience in using and monitoring CPM schedules on comparable projects.

1.4 FORMAT

A. Listings: Reading from left to right, in ascending order for each activity.
   1. Identify each activity with the applicable specification section number.
B. Diagram Sheet Size: 24” high x width required.
C. Scale and Spacing: To allow for notations and revisions.

1.5 SCHEDULES

A. Prepare network analysis diagrams and supporting mathematical analyses using the Critical Path Method, under concepts and methods outlined in AGC's “The Use of CPM in Construction - A Manual for General Contractors and the Construction Industry”.
B. Illustrate order and interdependence of activities and sequence of work, how the start of a given activity depends upon completion of preceding activities, and how completion of the activity may restrain start of subsequent activities.
C. Illustrate complete sequence of construction by activity, identifying work of separate stages.
   1. Provide dates for submittals including those for Owner furnished items and return of submittals; dates for procurement and delivery of critical products; and dates for installation and provision for testing.
   2. Provide legend for symbols and abbreviations used.
D. Mathematical Analysis: Tabulate each activity of detailed network diagrams, using calendar dates, and identifying for each activity:
1. Preceding and following event numbers
2. Activity description
3. Estimated duration of activity, in maximum 15-day intervals
4. Earliest start date
5. Earliest finish date
6. Actual start date
7. Actual finish date
8. Latest start date
9. Latest finish date
10. Total and free float; float time shall accrue to the owner and to the owner's benefit.
11. Monetary value of activity, keyed to Schedule of Values.
12. Percentage of activity completed.
13. Responsibility

E. Analysis Program: Capable of compiling monetary value of completed and partially completed activities, of accepting revised completion dates, and recompilation of all dates and floats.

F. Required Sorts: List activities in sorts or groups:
1. By preceding work item or event number from lowest to highest.
2. By amount of float, then in order of early start.
3. By responsibility in order of earliest possible start date.
4. In order of latest allowable start dates.
5. In order of latest allowable finish dates.
6. Contractor's periodic payment request sorted by Schedule of Values listings.
7. Listing of basic input data that generates the report.
8. Listing of activities on the critical path.
9. Provide sub-schedules for each state of Work identified in Section 01 11 00.
10. Coordinate contents with Schedule of Values in Section 01 29 00.

G. Commissioning activities: The schedule shall include required Commissioning activities and shall include the following specific issues.
1. Submission of Training Plans
2. Schedule Equipment and System Training and Demonstration scheduled prior to Functional Performance Testing.
4. Required Equipment and System Contractor Startup shall be complete prior to submission of Commissioning System Readiness Checklists.
5. Submission of Commissioning System Readiness Checklists.
7. Testing, Adjusting and Balancing shall be complete prior to Functional Performance Testing.

1.6 SUBMITTALS FOR REVIEW

A. Within 10 days after date in Notice to Proceed, submit proposed preliminary network diagram defining planned operations for the first 60 days of work, with a general outline for remainder of work.
B. Participate in review of preliminary and complete network diagrams jointly with Architect.
C. Within 20 days after joint review of proposed preliminary network diagram, submit draft of proposed complete network diagram for review.
1. Include written certification that major Subcontractors have reviewed and accepted proposed schedule.
D. Within 10 days after joint review, submit complete network analysis consisting of network diagrams and mathematical analysis.
E. Submit updated network schedules with each Application for Payment.
F. Submit one reproducible transparency and one opaque reproduction.
G. Submit under transmittal letterform specified in Section 01 33 00.

1.7 REVIEW AND EVALUATION

A. Participate in joint review and evaluation of network diagrams and analysis with Architect at each submittal.
B. Evaluate project status to determine work behind schedule and work ahead of schedule.
C. After review, revise as necessary as result of review, and resubmit within 10 days.

1.8 UPDATING SCHEDULES

A. Maintain schedules to record actual start and finish dates of completed activities.
B. Indicate progress of each activity to date of revision, with projected completion date of each activity.
   1. Update diagrams to graphically depict current status of work.
C. Identify activities modified since previous submittal, major changes in work, and other identifiable changes.
D. Indicate changes required to maintain Date of Substantial Completion.
E. Submit sorts required to support recommended changes.
F. Provide narrative report to define problem areas, anticipated delays and impact on the schedule.
   Report corrective action taken or proposed and its effect.

1.9 DISTRIBUTION

A. Following joint review, distribute copies of updated schedules to Contractor's project site file, to Subcontractors, Suppliers, Architect, Owner, Commissioning Authority, and other concerned parties.
B. Instruct recipients to promptly report, in writing, problems anticipated by projections shown in schedules.

PART 2 PRODUCTS

2.1 Not used.

PART 3 EXECUTION

3.1 Not used.

END OF SECTION
SECTION 01 33 00 - SUBMITTALS PROCEDURES

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Submittal procedures
B. Proposed products list
C. Product data
D. Shop drawings
E. Samples
F. Design data
G. Test reports
H. Certificates
I. Manufacturer's instructions
J. Manufacturer's field reports
K. Erection drawings

1.2 REFERENCES

A. AGC (Associated General Contractors of America) publication "The Use of CPM in Construction - A Manual for General Contractors and the Construction Industry".

1.3 SUBMITTAL PROCEDURES

A. Transmit each submittal with Architect accepted form.
   1. Electronic submittals shall be made for 8 ½ x 11 and 11 x 17 documents.
B. Sequentially number the transmittal forms.
   1. Revise submittals with original number and a sequential alphabetic suffix.
C. Identify project, Contractor, Subcontractor or supplier pertinent drawing and detail number, and specification section number, as appropriate.
D. Apply contractor's stamp, signed or initialed certifying that review, approval, verification of products required, field dimensions, adjacent construction work, and coordination of information are in accordance with the requirements of the work and contract documents.
E. Schedule submittals to expedite the project, and deliver to Architect and Construction Manager at business address.
   1. Coordinate submission of expedite the project, and deliver to Architect and Construction Manager at business address.
F. For each submittal for review, allow 15 days excluding delivery time to and from the Contractor.
G. Identify variations from contract documents and product or system limitations, which may be detrimental to successful performance of the completed work.
H. Provide space for Contractor and Architect review stamps.
I. When revised for resubmission, identify all changes made since previous submission.
J. Distribute copies of reviewed submittals as appropriate. Instruct parties to promptly report any inability to comply with requirements.
K. Submittals not requested will not be recognized or processed.

1.4 PROPOSED PRODUCTS LIST

A. Within 15 days after date of Notice to Proceed, submit 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.
1.5 PRODUCT DATA

A. Product Data For Review:
   1. Submitted to Architect for review for the purpose of checking for conformance with information given and the design concept expressed in the contract documents.
   2. After review, provide copies and distribute per the Submittal Procedures article above and for record documents purposes described in Section 01 70 00 - Contract Closeout.

B. Product Data For Information:
   1. Submitted for the Architect's knowledge as contract administrator or for the Owner.

C. Product Data For Project Close-out:
   1. Submitted for the Owner's benefit during and after project completion.

D. Submit the number of copies, which the Contractor requires, plus two copies for the Architect.

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

F. Supplement manufacturers' standard data to provide information unique to this project.

G. Indicate product utility and electrical characteristics, utility connection requirements, and location of utility outlets for service for functional equipment and appliances.

H. After review, distribute in accordance with the Submittal Procedures article above and provide copies for record documents described in Section 01 70 00 - Contract Closeout.

1.6 SHOP DRAWINGS

A. Shop Drawings For Review:
   1. Submit to Architect for review for the purpose of checking for conformance with information given and the design concept expressed in the contract documents.
   2. After review, produce copies and distribute per the Submittal Procedures article above and for record documents purposes described in Section 01 70 00 - Contract Closeout.

B. Shop Drawings For Information:
   1. Submitted for the Architect's knowledge as contract administrator or for the Owner.

C. Shop Drawings For Project Close-out:
   1. Submitted for the Owner's benefit during and after project completion.

D. Indicate special utility and electrical characteristics, utility connection requirements, and location of utility outlets for service for functional equipment and appliances.

E. Submit the number of copies, which the Contractor requires, plus two copies for the Architect.

1.7 SAMPLES

A. Samples For Review:
   1. Submitted to Architect for review for the purpose of checking for conformance with information given and the design concept expressed in the contract documents.
   2. After review, provide duplicates and distribute per the Submittal Procedures article above and for record documents purposes described in Section 01 70 00 - Contract Closeout.

B. Samples For Information:
   1. Submitted for the Architect's knowledge as contract administrator or for the Owner.

C. Samples For Selection:
   1. Submitted to Architect for aesthetic, color, or finish selection.
   2. Submit samples of finishes from the full range of manufacturers' standard colors, textures, and patterns for Architect selection.
   3. After review, provide duplicates and distribute per the Submittal Procedures article above and for record documents purposes described in Section 01700 - Contract Closeout.

D. Submit samples to illustrate functional and aesthetic characteristics of the product, with integral parts and attachment devices.

E. Coordinate sample submittals for interfacing work.

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

G. Submit the number of samples specified in specification, one of which the Architect shall retain.

H. Reviewed samples, which may be used in the work, are indicated in specifications.

I. Samples are not used for testing purposes unless specifically stated in the specification.
1.8 DESIGN DATA
A. Submit for the Architect's knowledge as contract administrator or for the Owner.
B. Submit for information for the limited purpose of assessing conformance with information given and the design concept expressed in the contract documents.

1.9 TEST REPORTS
A. Submit for the Architect's knowledge as contract administrator or for the Owner.
B. Submit test reports for information for the purpose of assessing conformance with information given and the design concept expressed in the contract documents.

1.10 CERTIFICATES
A. When specified in specification, submit certification by the manufacturer, installation/application subcontractor, or the contractor to Architect, in quantities specified for Product Data.
B. Indicate material or Product conforms to or exceeds specified requirements.
   1. 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.

1.11 MANUFACTURER’S INSTRUCTIONS
A. When specified in individual specification sections, submit printed instructions for delivery, storage, assembly, installation, start-up, adjusting, and finishing, to Architect for delivery to Owner in quantities specified for Product Data.
B. Indicate special procedures, perimeter conditions requiring special attention, and special environmental criteria required for application or installation.
C. Refer to Section 01 45 00 - Quality Control, Manufacturer's Field Services article.

1.12 MANUFACTURER’S FIELD REPORTS
A. Submit reports for the Architect's benefit as contract administrator or for the Owner.
B. Submit report within 30 days of observation to Architect for information.
C. Submit for information for the limited purpose of assessing conformance with information given and the design concept expressed in the contract documents.

1.13 ERECTION DRAWINGS
A. Submit drawings for the Architect's benefit as contract administrator or for the Owner.
B. Submit for information for the limited purpose of assessing conformance with information given and the design concept expressed in the contract documents.
C. Data indicating inappropriate or unacceptable work is subject to action by the Architect or Owner.

PART 2 PRODUCTS
2.1 Not Used.

PART 3 EXECUTION
3.1 Not Used.

END OF SECTION
SECTION 01 41 00 - REGULATORY REQUIREMENTS

PART 1 GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provision of Contract, including General and Supplementary Conditions and Division 1 specification sections, apply to work in this section.

1.2 CODE REQUIREMENTS

A. Perform all work on this Project in strict accordance with, but not limited to, applicable requirements and portions of the latest editions of the currently adopted codes, revisions, amendments, and their references.

1. Florida Building Code 2017:
   a. Florida Building Code – Existing Building
   b. Florida Accessibility Code
   c. National Electric Code (NEC) 2005; FBC Chapter 27
   d. Florida Building Code – Fuel Gas
   e. Florida Building Code – Mechanical
   f. Florida Building Code – Plumbing
   g. FBC Test Protocols for High Velocity Wind Zones
   h. FBC Referenced Codes and Standards -- Chapter 35

2. Florida Fire Prevention Code 2007, including:
   b. NFPA 10 – 2002: Standard for Portable Fire Extinguishers
   c. NFPA 13- 2002: Standard for Installation of Sprinklers Systems
   h. NFPA 70- 2008: National Electrical Code
   j. NFPA 90A – 2002: Standard for the Installation of Air Conditioning and Ventilating Systems
   k. NFPA 90B- 2002: Standard for the Installation of Warm Air Heating and Air Conditioning Systems
   o. NFPA 241-08: Standard for Safe Guarding Construction, Alteration and Demolition Operations

3. Required Permits
   a. All Building Permits are to be issued by the Building Official at the City of Riviera Beach, Florida, prior to the start of construction.
   c. Department of Environmental Protection (DEP) area Branch and NPDES Permits.

4. UL Fire Resistance Directory 2006 or verified at www.ul.com

5. Federal Requirements including:
   a. OSHA (Occupational Safety and Heath Administration, US Department of Labor, CFR 29 as Revised July 1995

1.3 CODE STANDARDS

A. All work shall conform to applicable portions of the adopted, or if not adopted, the latest edition of the standards listed which shall include, but is not limited to, the following:
1. Aluminum Association (AA)
2. American Concrete Institute (ACI)
3. American Institute of Steel Construction (AISC)
4. American National Standards Institute (ANSI)
5. American Society for Testing and Materials (ASTM)
6. American Society of Mechanical Engineers (ASME)
7. American Society of Heating, Refrigeration and Air Conditioning Engineers (ASHRAE)
8. American Welding Society (AWS)
9. Architectural Woodworking Institute (AWI)
10. Architectural Aluminum Manufacturer's Association (AAMA)
11. Commercial Standards (CS)
12. Federal Specifications and Standards (FSS)
13. National Occupations Safety and Health Administration (OSHA)
14. National Institute for Standards and Technology (NIST)
15. Architectural Sheet Metal Manual (SMACNA)
16. Underwriter's Laboratories (UL)
17. U.S. of America Standards Institute (ASI)
18. U.S. Department of Commerce Product Standards (USDCPS)

1.4 CODE DISCREPANCIES

A. In case of discrepancy between the codes, standards, and specifications listed, the most strict or most stringent requirement shall govern.

1.5 COMPLIANCE WITH CODES

A. A permit issued by the City of Riviera Beach Building Department will be construed as permission to proceed with construction, and not as authority to violate, cancel, alter, or set aside any of the provisions of any Codes, nor shall issuance of a permit prevent the Building Official from thereafter requiring a correction of errors in plans, construction, or violations of any Codes.

PART 2 PRODUCTS

2.1 NOT USED

PART 3 EXECUTION

3.1 NOT USED

END OF SECTION
SECTION 01 45 00 – QUALITY CONTROL

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Selection and payment
B. Quality Assurance
C. Laboratory reports
D. Limits on testing laboratory authority
E. Contractor responsibilities

1.2 REFERENCES

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

1.3 SELECTION AND PAYMENT

A. Owner will employ and pay for services of an independent testing laboratory to perform specified inspection and testing.
B. Employment of testing laboratory shall in no way relieve Contractor of obligation to perform work in accordance with requirements of Contract Documents.

1.4 QUALITY ASSURANCE

A. Laboratory: Authorized to operate in State of Florida.
B. Laboratory Staff: Maintain a full time registered Engineer on staff to review services.
C. Testing Equipment: Calibrated at reasonable intervals with devices of accuracy traceable to either National Bureau of Standards (NBS) Standards or accepted values of natural physical constants.

1.5 LABORATORY REPORTS

A. After each inspection and test, submit 2-copies of laboratory report to Owner, Architect, and Contractor.
B. Include:
   1. Date issued
   2. Project title and number
   3. Name of inspector
   4. Date and time of sampling or inspection
   5. Identification of product and Specifications Section
   6. Location in the Project
   7. Type of inspection or test
   8. Date of test
   9. Results of tests
   10. Conformance with Contract Documents
C. When requested by Architect, provide interpretation of test results.
1.6 LIMITS ON TESTING LABORATORY AUTHORITY

A. Laboratory may not release, revoke, alter, or enlarge on requirements of Contract Documents.
B. Laboratory may not approve or accept any portion of the Work.
C. Laboratory may not assume any duties of Contractor.
D. Laboratory has no authority to stop the Work.

1.7 CONTRACTOR RESPONSIBILITIES

A. Deliver to laboratory at designated location, adequate samples of materials used, which require testing, along with proposed mix designs.
B. Cooperate with laboratory personnel, and provide access to the Work and to manufacturer's facilities.
C. Provide incidental labor and facilities to provide access to Work to be tested, to obtain and handle samples at the site or at source of products to be tested, to facilitate tests and inspections, storage and curing of test samples.
D. Notify Owner, Commissioning Authority, Architect and laboratory 24 hours prior to expected time for operations requiring inspection and testing services.
E. Arrange with laboratory and pay for additional samples and tests required by Contractor beyond specified requirements, and pay compensation for Architect's additional services made necessary by failed tests and inspections.

PART 2 PRODUCTS

2.1 Not Used.

PART 3 EXECUTION

3.1 Not Used.

END OF SECTION
SECTION 01 50 00 - TEMPORARY FACILITIES AND CONTROLS

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Temporary Utilities: Electricity, lighting, heat, ventilation, telephone, water, and sanitary.
B. Temporary Controls: Barriers, enclosures and fencing, protection of the Work, and water control.
C. Construction Facilities: Access roads, parking, progress cleaning, project signage, and temporary buildings.

1.2 REGULATORY REQUIREMENTS

A. Conform to all applicable codes, standards and requirements
   1. Florida Building Code (current)
   2. Florida Fire Prevention Code
   3. OSHA standards
   4. All Local Requirements
   5. Other related or referenced codes and standards listed in items 1 thru 5 above

1.3 TEMPORARY ELECTRICITY

A. Cost: By Contractor, provide and pay for power service required from utility source.
B. Provide temporary electric feeder from existing building electrical service at location as directed.
   1. Do not disrupt Owner's use of service.
C. Complement existing power service capacity and characteristics as required.
D. Provide power outlets for construction operations, with branch wiring and distribution boxes located as required.
   1. Provide flexible power cords as required to comply with OSHA standards.
E. Provide main service disconnect and over-current protection at convenient location.
F. May use permanent convenience receptacles during construction as long as the use does not trip circuit breakers in the building or otherwise interferes with Owner's use of service.

1.4 TEMPORARY LIGHTING FOR CONSTRUCTION PURPOSES

A. Provide and maintain lighting for construction operations to achieve a minimum lighting level of 2-Watt/sq ft.
B. Provide and maintain 1-Watt/sq ft security lighting to exterior staging and storage areas after dark.
C. Provide branch wiring from power source to distribution boxes with lighting conductors, pigtails, and lamps as required.
D. Maintain lighting and provide routine repairs.
E. May use permanent building lighting during construction.

1.5 TEMPORARY HEATING

A. Provide and pay for heating devices and heat as needed to maintain specified conditions for construction operations.
B. Prior to operation of permanent equipment for temporary heating purposes, verify the installation is approved for operation; equipment is lubricated and filters in place.
   1. Provide and pay for operation, maintenance and regular replacement of filters and worn or consumed parts.
C. Maintain minimum ambient temperature of 50°F in areas where construction is in progress, unless indicated otherwise in product sections.

1.6 TEMPORARY COOLING
A. Provide and pay for cooling devices and cooling as needed to maintain specified conditions for construction operations.
B. Prior to operation of permanent equipment for temporary cooling purposes, verify the installation is approved for operation; equipment is lubricated and filters in place.
   1. Provide and pay for operation, maintenance, and regular replacement of filters and worn or consumed parts.
C. Maintain maximum ambient temperature of 80°F in areas where construction is in progress, unless indicated otherwise in specifications.
D. Unless indicated otherwise in specifications, in areas where construction is in progress, maintain maximum relative humidity of 60%, or as dry as possible, to prevent the formation of mold.

1.7 TEMPORARY VENTILATION

A. Ventilate enclosed areas to achieve curing of materials, to dissipate humidity, and to prevent accumulation of dust, fumes, vapors, or gases.
B. Utilize existing ventilation equipment.
   1. Extend and supplement equipment with temporary fan units as required to maintain clean air for construction operations.

1.8 TELEPHONE SERVICE

A. Provide, maintain, and pay for telephone service, including long distance, to Owner's field office at time of project mobilization and continue until Final Completion.

1.9 FACSIMILE SERVICE

A. Provide, maintain and pay for facsimile service and a dedicated telephone line to field office and Owner's field office at time of project mobilization.

1.10 TEMPORARY WATER SERVICE

A. Provide, maintain and pay for suitable quality water service required.
B. Extend branch piping with outlets located so water is available by hoses with threaded connections.

1.11 TEMPORARY SANITARY FACILITIES

A. Provide and maintain required sanitary facilities and enclosures for start of project mobilization through the end of project do not use any existing facilities.
B. At end of construction, return facilities to same or better condition as originally found.

1.12 BARRIERS

A. Provide barriers to prevent unauthorized entry to construction areas, to allow for Owner's use of site, and to protect existing facilities and adjacent properties from damage from construction operations and demolition.
B. Provide barricades and covered walkways required by governing authorities for public rights-of-way and for public access to existing building.
C. Provide protection for plants designated to remain.
   1. Replace damaged plants.
D. Protect non-owned vehicular traffic, stored materials, site, and structures from damage.

1.13 FENCING

A. Construction: Commercial grade chain link fence or Solid wood fence as designated on drawings.
B. Provide 6’ high fence around construction site; equip with vehicular and pedestrian gates with locks.
   1. Provide top rail/support on all temporary fencing.
   2. Provide wind screen on temporary fencing.

1.14 WATER CONTROL

A. Grade site to drain and keep excavations free of water.
   1. Provide, operate, and maintain pumping equipment as necessary.
B. Protect site from ponding or running water with water barriers as required to prevent soil erosion.

1.15 EXTERIOR ENCLOSURES

A. 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.
B. Provide access doors with self-closing hardware and locks.

1.16 INTERIOR ENCLOSURES

A. Provide temporary partitions and ceilings as indicated to separate the work areas from Owner occupied areas, to prevent penetration of dust and moisture into Owner occupied areas, and to prevent damage to existing materials and equipment.
B. Construction: Framing shall be metal stud and gypsum board with reinforced polyethylene sheet materials with closed joints and sealed edges at intersections with existing surfaces:
   1. STC rating of 35 in accordance with ASTM E90
   2. Maximum flame spread rating of 25 in accordance with ASTM E84.

1.17 PROTECTION OF INSTALLED WORK

A. Protect completed work and provide special protection as specified in other specification sections.
B. Provide temporary and removable protection for installed products.
   1. Control activity in immediate work area to prevent damage.
C. Provide protective coverings at walls, projections, jambs, sills, and soffits of openings.
D. Protect finished floors, stairs, and other surfaces from traffic, dirt, wear, damage, or movement of heavy objects, by protecting with durable sheet materials.
E. Prohibit traffic or storage upon waterproofed or roofed surfaces.
   1. If traffic or activity is necessary, obtain recommendations for protection from waterproofing or roofing material manufacturer.
F. Prohibit traffic from landscaped areas.

1.18 SECURITY

A. Provide security and facilities to protect Work, and existing facilities, and Owner’s operations from unauthorized entry, vandalism, or theft.
B. Coordinate with Owner’s security program.

1.19 ACCESS ROADS

A. Construct and maintain temporary roads accessing public thoroughfares to serve construction area.
B. Extend and relocate, as required to provide detours necessary for unimpeded traffic flow.
C. Provide and maintain access to fire hydrants, free of obstructions.
D. Provide means of removing mud from vehicle wheels before entering streets.
E. Only use designated existing on-site roads for construction traffic.

1.20 PARKING

A. Arrange for temporary surface parking areas to accommodate construction personnel.
B. When site space is not adequate, provide additional off-site parking.
C. Do not allow vehicle parking on existing pavement.
D. Designate two parking spaces for the Owner.

1.21 PROGRESS CLEANING AND WASTE REMOVAL

A. Maintain site in a clean and orderly condition free of waste materials, debris, and rubbish.
B. Remove debris and rubbish from pipe chases, plenums, attics, crawl spaces, and other closed or remote spaces, prior to enclosing the space.
C. Broom and vacuum clean interior areas prior to start of surface finishing, and continue cleaning to eliminate dust.
D. Collect and remove waste materials, debris, and rubbish from site weekly and properly dispose off-site.
E. No open free-fall chutes permitted terminate closed chutes into appropriate containers with lids.

1.22 PROJECT IDENTIFICATION

A. Provide 8’ w x 4’ h project sign of exterior grade plywood and wood frame construction, painted, with exhibit lettering by professional sign painter or die cut vinyl, self-adhesive letters and self-adhesive the Palm Beach State College logo, to Owner's design and colors.
   1. Wording on project sign per current requirements by Program Management to include the Project Coordinator's name and telephone contact number.
B. Provide a sign near workers entrance with the following information in addition to other required safety instructions:
   1. WARNING: HARD HAT AREA
   2. WORK SITE RULES:
      a. BE ALERT, REPORT UNSAFE CONDITIONS IMMEDIATELY TO JOB SUPERINTENDENT OR PALM BEACH STATE COLLEGE REPRESENTATIVE.
      b. NO SMOKING, DRUGS, ALCOHOL or LOUD RADIO PLAYING
      c. NO INAPPROPRIATE CONTACT WITH STUDENTS or UNIVERSITY STAFF (This is for a student occupied campus)
      d. THE FOLLOWING MUST BE WORN AT ALL TIMES:
         i) HARD HATS and SAFETY GLASSES
         ii) HARD SOLE SHOES (NO SNEAKERS)
         iii) SHIRTS AND LONG PANTS
   3. YOUR COOPERATION IS GREATLY APPRECIATED
C. Contractors and Designers identification signs shall be located in such a way as to not distract from the Riviera Beach Community Redevelopment project sign or interfere with traffic site lines at driveways.
D. Provide permanent and temporary free standing exterior signs that shall comply with Florida Building Code (FBC) Chapter 16, and wind Load factors in FBC Table 1606.
E. Erect on site at location indicated.
F. All other signs require Owner's permission except those required by law.

1.23 FIELD OFFICES AND SHEDS

A. Office: Weather-tight, with lighting, electrical outlets, heating, cooling and ventilating equipment, and equipped with sturdy furniture, drawing rack and drawing display table.
B. Locate offices and sheds a minimum distance of 30' from existing and new structures.
C. Design field offices and sheds and tied down to resist hurricane force wind loads.

1.24 REMOVAL OF UTILITIES, FACILITIES, AND CONTROLS

A. Remove temporary utilities, equipment, facilities, and materials, prior to Substantial Completion inspection.
B. Remove underground installations to a minimum depth of 2’. Grade site as indicated.
C. Clean and repair damage caused by installation or use of temporary work.
D. Restore existing and permanent facilities used during construction to original condition. Restore permanent facilities used during construction to specified condition.

1.25 TEMPORARY LIFE SAFETY CONTROLS

A. Maintain any existing fire alarm, fire protection, and emergency lighting systems for the duration of the project.

1.26 HURRICANE and SEVERE STORM PROTECTION

A. Construction Manager/Contractor shall develop a plan and implementation procedure for preparing the constructions site in the event of a hurricane or severe storm warning.
B. The plan shall be developed with the Palm Beach State College representatives.
C. It shall include as a minimum:
   1. Securing construction material from becoming wind borne debris during high winds.
   2. Securing and protecting partially completed building components during the event.

PART 2 PRODUCTS

2.1 Not Used.

PART 3 EXECUTION

3.1 Not Used.

END OF SECTION
SECTION 01510 (01 51 00)
TEMPORARY UTILITIES

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Water Service and Distribution.
B. Temporary Electric Power and Light.
C. Telephone Service.
D. Storm and Sanitary Sewer.
E. Temporary Heat.
F. Temporary Ventilation.
G. Dewatering Facilities and Drains.

1.2 RELATED DOCUMENTS

A. Document 00520-Agreement Form
B. Document 00700-General Conditions of the Contract
C. Section 01520-Construction Facilities

1.3 SUBMITTALS

A. Temporary Utilities: Submit reports of tests, inspections, meter readings and similar procedures performed on temporary utilities.

B. Implementation and Termination Schedule: Submit a schedule indicating implementation and termination of each temporary utility within 15 days of the receipt of Document 00550-Notice to Proceed. At the earliest feasible time, when acceptable to the Project Consultant and Owner, change over from use of temporary service to use of the permanent service.

C. Contractor shall pay for, or reimburse Owner for use of temporary and permanent utility service until occupancy by the Owner.

1.4 QUALITY ASSURANCE

A. Regulations: Comply with industry standards and applicable laws and regulations if authorities having jurisdiction, including but not limited to:
1. The Florida Building Code and Amendments including State Requirements for Educational Facilities (SREF) requirements.
2. Health and safety regulations.
3. Utility company requirements.
4. Police, Fire Department and Rescue Squad requirements.
5. Environmental protection regulations.

B. Comply with:
   2. ANSI-A10 Series standards for "Safety Requirements for Construction and Demolition".
   3. NECA Electrical Design Library "Temporary Electrical Facilities."

C. Refer to "Guidelines for Bid Conditions for Temporary Job Utilities and Services", prepared jointly by AGC and ASC, for industry recommendations.

D. Electrical Service:
   1. Comply with NEMA, NECA and UL standards and regulations for temporary electric service.
   2. Install service in compliance with National Electric Code (NFPA 70).

E. Inspections: Arrange for inspection and testing by BCI and other authorities having jurisdiction under provisions of Section 01450-Quality Control.

F. Obtain required certifications and permits.

1.5 CONDITIONS OF USE

A. Keep temporary services and facilities clean and neat in appearance.

B. Operate in a safe and efficient manner.

C. Take necessary fire prevention measures.

D. Do not overload facilities, or permit them to interfere with progress.

E. Do not allow dangerous or unsanitary conditions, or public nuisances to develop or persist on the site.

PART 2 PRODUCTS

2.1 MATERIALS

A. Provide new materials; if acceptable to the Project Consultant, undamaged previously used materials in serviceable condition may be used.

B. Provide materials suitable for the use intended.

C. Water: Provide potable water approved by local health authorities.

2.2 EQUIPMENT

A. Provide new equipment.
   1. Undamaged, previously used equipment in serviceable condition may be used.
   2. Provide equipment suitable for use intended.

B. Water Hoses:
   1. Provide 3/4 inch heavy-duty, abrasion-resistant, flexible rubber hoses 100 feet long, with pressure rating greater than the maximum pressure of the water distribution system
2. Provide adjustable shut-off nozzles at hose discharge.

C. Electrical Outlets:
   1. Provide properly configured NEMA polarized outlets to prevent insertion of 110-120 volt plugs into higher voltage outlets.
   2. Provide receptacle outlets equipped with ground-fault circuit interrupters, reset button and pilot light, for connection of power tools and equipment.

D. Electrical Power Cords:
   1. Provide grounded extension cords; use "hard-service" cords where exposed to abrasion and traffic.
   2. Provide waterproof connectors to connect separate lengths of electric cords, if single lengths will not reach areas where construction activities are in progress.

E. Lamps and Light Fixtures:
   1. Provide general service incandescent lamps of wattage required for adequate illumination.
   2. Provide guard cages or tempered glass enclosures, where exposed to breakage.
   3. Provide exterior fixtures where exposed to moisture.

F. Heating Units: Provide temporary heating units that have been tested and labeled by UL, FM or another recognized trade association related to the type of fuel being consumed.

PART 3 EXECUTION

3.1 INSTALLATION

A. Use qualified personnel for installation of temporary utilities and conform to the workforce composition and supervision requirements specified elsewhere in the Contract Documents.

B. Locate temporary utilities where they will serve the Project adequately and result in minimum interference with performance of the Work or existing.

C. Relocate and modify facilities as required.

D. Provide each temporary utility ready for use when needed to avoid delay.

E. Maintain and modify as required.

F. Do not remove until temporary utilities are no longer needed, or are replaced by authorized use of completed permanent utility.

3.2 TEMPORARY UTILITY INSTALLATION

A. General Requirements:
   1. Engage the appropriate local utility company to install temporary service or connect to existing service. Where the company provides only part of the service, provide the remainder with matching, compatible materials and equipment; comply with the company's recommendations.
   2. Arrange with the company and Project Consultant for a time when service can be interrupted, where necessary, to make connections for temporary services. The Project Consultant and the Owner will coordinate service interruptions with the occupants of existing facilities.
3. Provide adequate capacity at each stage of construction. Prior to temporary utility availability, provide trucked-in services.
4. Coordinate with Project Consultant and Owner to obtain easements to bring temporary utilities to the site, where the Owner's easements cannot be used for that purpose.
5. Use Charges: Cost or use charges for temporary facilities are not chargeable to the Owner or Project Consultant, and shall not be accepted as a basis of claims for a Change Order.

B. Water Service:
1. Install water service and distribution piping of sizes and pressures adequate for construction until permanent water service is in use.
2. Sterilization: Sterilize temporary water piping prior to use.
3. If water needed for construction is not allowable for Owner's on-site facilities, the Contractor shall provide at no additional cost to the Owner such utilities.

C. Temporary Electric Power Service:
1. Provide weatherproof, grounded electric power service and distribution system of sufficient size, capacity, and power characteristics during construction period. Include meters, transformers, overload protected disconnects, automatic ground-fault interrupters and main distribution switchgear.
2. Temporary Power Distribution System: Install wiring overhead and rises vertically where least exposed to damage.
3. Temporary Power Outlets: Provide in numbers as required for execution of the Work.

D. Temporary Lighting:
1. After installation of temporary power connections, provide the following:
   (a) Temporary Lighting: As the building is enclosed, provide temporary lighting as required or according to Project Consultant's direction consisting of one 100-watt lamp for each 250 square feet of area, but not less than 1 lamp per area.
2. Whenever overhead floor or roof deck has been installed, provide temporary lighting with local switching.
3. Install and operate temporary lighting that will fulfill security and protection requirements, without operating the entire system, and will provide adequate illumination for construction operations and traffic conditions.
   (a) Provide and maintain incandescent or other lighting for construction operations to achieve a minimum lighting level of 2-watt/sq. ft.
   (b) Provide and maintain 1 watt/sq. ft lighting to exterior staging and storage areas after dark for security purposes.
   (c) Provide and maintain 0.25-watt/sq. ft H.I.D. 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 shall not be utilized during construction.
7. Install exterior yard and sign lights so that signs are visible when Work is being performed.

E. Temporary Telephones:
1. Provide temporary telephone service for all personnel engaged in construction activities, throughout the construction period.
2. Install telephone on a separate dedicated line for:
   (a) Each temporary office and first aid station
   (b) Fax machines.
   (c) Computers (minimum 2 connections in Owner/DCP Office).
3. Where an office has more than two occupants, install a telephone for each additional occupant or pair of occupants.
4. At each telephone: Provide a white pages and yellow pages phone directory local to site and post a list of important telephone numbers including key contacts for the Owner, Project Consultant, and Contractor.

5. Temporary Cellular Telephone Service: If regular telephone lines can not be provided or regular temporary telephone service must be curtailed or interrupted for longer than 2 days, provide temporary cellular service for the use of the Contractor, Contractor’s employees, the Owner and Project Consultant:
   (a) Provide at least one cellular base unit in the Contractor's field office and provide other phones at the Contractor’s option or as required by regulations.
   (b) Provide one cellular base unit with a separate line in the Owner's field office.
   (c) Cellular phone “base units” shall have “permanently” attached antenna mounted to the exterior of the construction offices, extending above the highest point of the roof, so as to provide the best possible reception and clarity.

F. Sewers and Drainage:
1. If sewers are available, provide temporary connections to remove effluent that can be discharged lawfully.
2. If sewers are not available or cannot be used, provide drainage ditches, dry wells, stabilization ponds and similar facilities if allowed by the Project Consultant, Owner or other municipal or county jurisdictional authorities. Coordinate requirements with Owner.
3. If neither sewers nor drainage facilities can be lawfully used for discharge of effluent, provide containers to remove and dispose of effluent off the site in a lawful manner.
4. Filter out excessive amounts of soil, construction debris, chemicals, oils and similar contaminants that might clog sewers or pollute waterways before discharge.
5. Connect temporary sewers to the municipal system as directed by the sewer department officials.
6. Maintain temporary sewers and drainage facilities in a clean, sanitary condition. Following heavy use, restore normal conditions promptly.
7. Provide earthen embankments and similar barriers in and around excavations and subgrade construction, sufficient to prevent flooding by runoff of storm water from heavy rains.
8. Do not allow pollution or contamination of the site, adjacent properties or waterways.

G. Temporary Heat:
1. Provide necessary, power, temporary heat, systems in operation to provide proper humidity and temperature conditions for curing or drying completed installations, protection of installed construction from adverse affects, installations or application of flooring, paint coatings, acoustical ceilings, and another items requiring climate control at appropriate locations or any other means acceptable to Owner and Project Consultant.
2. Select safe equipment that shall not have a harmful effect on completed installations or elements being installed. Ensure safety from fire hazard.
3. Coordinate ventilation requirements to produce the ambient condition required and minimize consumption of energy.
4. Heating Facilities: Except where use of the permanent system is authorized, provide vented self-contained LP gas or fuel oil heaters with individual space thermostatic control.
5. Use of gasoline-burning space heaters, open flame, or salamander type heating units shall be prohibited.

H. Temporary Ventilation and Cooling:
1. Provide necessary temporary ventilation fans, power, or place air-conditioning systems in operation to provide proper humidity and temperature conditions for installation or application of flooring, paint coatings, acoustical ceilings, prevent accumulation of dust, fumes, vapors, or gases, and any other items requiring climate control or ventilation at appropriate locations or any other means acceptable to Board and Project Consultant.
2. Utilize existing ventilation or cooling equipment. Extend and supplement equipment with temporary fan units as required to maintain clean air for construction operations.
3. Do not expose students, faculty, or staff of school facility to dust, fumes, vapors, gasses, or noxious odors. Limit construction operations that produce dust, fumes, vapors, gasses, and noxious odors to times when adjacent Owner occupied spaces are vacant from the time of generation to the time of dissipation.

I. Dewatering Facilities and Drains:
   1. For temporary drainage and dewatering facilities and operations not directly associated with construction activities included under individual Specification Sections, comply with dewatering requirements of applicable Division-2 Sections. Where feasible, utilize the same facilities.
   2. Maintain the site, excavations and construction free of water.

3.3 OPERATION, TERMINATION AND REMOVAL

A. Supervision: Enforce strict discipline in use of temporary utilities. Limit availability of temporary utilities to essential and intended uses to minimize waste and abuse.

B. Maintenance: Maintain temporary utilities in good operating condition until removal. Protect from damage by heat, humidity, and similar elements including periods of cold conditions.
   1. Maintain operation of temporary, heating, cooling, humidity control, ventilation and similar facilities on a 24-hour per day basis where required to achieve indicated results and to avoid possibility of damage.
   2. Protection: Maintain markers for underground lines. Protect from damage during excavation operations.

C. Termination and Removal:
   1. Unless the Project Consultant requests that it be maintained longer, remove each temporary facility when the need has ended, or when replaced by authorized use of a permanent facility, or no later than Substantial Completion.
   2. Complete and restore permanent construction that may have been delayed because of interference with the temporary facility.
   3. Repair damaged Work, clean exposed surfaces and replace construction that cannot be satisfactorily repaired.

D. Prior to Substantial Completion, clean and renovate permanent facilities that have been used during the construction period.

END OF SECTION
SECTION 01 57 00 - TEMPORARY CONTROLS

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Temporary Controls
   1. Dust Control
   2. Erosion and Sediment Control
   3. Noise Control
   4. Pest Control
   5. Pollution Control
   6. Rodent Control
   7. Environmental (temperature, relative humidity) Control

1.2 DUST CONTROL

A. Employ any and all specified controls required to protect Owner’s existing property and facilities.
B. Execute work by methods to minimize raising dust from construction operations.
C. Provide positive means to prevent air-borne dust from dispersing into atmosphere.
D. Provide means to control dust and debris from entering the public streets and rights of way.

1.3 EROSION AND SEDIMENT CONTROL

A. Plan and execute construction by methods to control surface drainage from cuts and fills, from
   borrow and waste disposal areas. Prevent erosion and sedimentation.
B. Minimize amount of bare soil exposed at one time.
C. Provide temporary measures such as berms, dikes, and drains, to prevent water flow.
D. Construct fill and waste areas by selective placement to avoid erosive surface silts or clays.
E. Periodically inspect earthwork to detect evidence of erosion and sedimentation; promptly apply
   corrective measures.
F. Do not allow mud or debris laden runoff to enter existing storm water system.

1.4 NOISE CONTROL

A. Provide methods, means, and facilities to minimize noise from and noise produced by construction
   operations.

1.5 PEST CONTROL

A. Provide methods, means, and facilities to prevent pests and insects from entering the work zone.

1.6 POLLUTION CONTROL

A. Provide methods, means, and facilities to prevent contamination of soil, water, and atmosphere
   from discharge of noxious, toxic substances, and pollutants produced by construction operations.

1.7 RODENT CONTROL

A. Provide methods, means, and facilities to prevent rodents from accessing or invading premises.
1.8 ENVIRONMENTAL CONTROL

A. Maintain temperature in accordance with Section 01 57 19.
B. Maintain relative humidity in accordance with Section 01 57 19.
C. Contractor is responsible for environmental control until the Palm Beach State College accepts the facility with the Certificate of Occupancy (CO) or the Temporary Certificate of Occupancy (TCO).
   a. Contractor is responsible for any damage caused by the formation of mold and mildew or other deterioration of any building materials prior to CO or TCO.

PART 2 PRODUCTS

2.1 Not Used.

PART 3 EXECUTION

3.1 Not Used.

END OF SECTION
SECTION 01 60 00 – PRODUCT REQUIREMENTS

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Products
B. Transportation and handling
C. Storage and protection
D. Product options
E. Substitutions
F. Approved Equals

1.2 PRODUCTS

A. Product means new material, machinery, components, equipment, fixtures, and systems forming the work, it does not include machinery and equipment used for preparation, fabrication, conveying and erection of the work.
   1. May also include existing materials or components required for reuse.
B. Do not use materials and equipment removed from existing premises, except as specifically permitted by the Contract Documents.
C. Provide interchangeable components of the same manufacturer, for similar components.

1.3 TRANSPORTATION AND HANDLING

A. Transport and handle products in accordance with manufacturer's instructions.
B. Promptly inspect shipments to assure that products comply with requirements, quantities are correct, and products are undamaged.
C. Provide equipment and personnel to handle products by methods to prevent soiling, disfigurement, or damage.

1.4 STORAGE AND PROTECTION

A. Store and protect products in accordance with manufacturer's instructions, with seals and labels intact and legible.
B. Store sensitive products in weather-tight, climate controlled enclosures.
C. For exterior storage of fabricated products, place on sloped supports, above ground.
D. Provide off-site storage and protection when site does not permit on-site storage or protection.
E. Cover products subject to deterioration with impervious sheet covering, and provide ventilation to avoid condensation.
F. Store loose granular materials on solid flat surfaces in a well-drained area avoid mixing with foreign matter.
G. Provide equipment and personnel to store products by methods to prevent soiling, disfigurement, or damage.
H. Arrange product storage to permit access for inspection, and periodically inspect for damage and correct storage conditions, if damaged or incorrect storage conditions take corrective action.

1.5 PRODUCT OPTIONS

A. Products Specified by Reference Standards or by Description Only: Any product meeting those standards or description.
B. Products Specified by Naming One or More Manufacturers: Products of manufacturers named and meeting specifications, no options or substitutions allowed.
C. Products Specified by Naming One or More Manufacturers with a Provision for Substitutions: Submit a request for substitution for any manufacturer not named.
1.6 SUBSTITUTIONS

A. Instructions to Bidders specify time restrictions for submitting requests for substitutions during the bidding period to requirements specified in this section.
B. If a product becomes unavailable through no fault of the Contractor, substitutions may be considered.
C. Document each request with complete data substantiating compliance of proposed Substitution with Contract Documents.
D. A request constitutes a representation that the Bidder or Contractor:
   1. Has investigated proposed product and determined that it meets or exceeds the quality level of the specified product.
   2. Will provide the same warranty for the substitution as for the specified product.
   3. Will coordinate installation and make changes to other work that may be required for the work to be complete with no additional cost to Owner.
   4. Waives claims for additional costs or time extension, which may become apparent.
   5. Will reimburse Owner for review or redesign services associated with re-approval.
E. Substitutions will not be considered when they are indicated or implied on shop drawing or product data submittals, without separate written request, or if acceptance requires revision to the contract documents.
F. The Owner and A/E shall review the request and either approve or deny the request in writing.
   1. The Commissioning Authority may, upon request by the Owner, advise the Owner on the technical and operations & maintenance impacts of the request.
G. Installation of substitutions without the Owner's approval, shall be cause for immediate rejection and removal with out extra cost to the owner.
H. Substitutions that diminish life safety systems are prohibited.

1.7 APPROVED EQUAL

A. It is not the Riviera Beach Community Redevelopment Agency's (RB CRA) intention to limit open competition of products supplied on the construction of schools, but it is our intention to provide products that are cost effective do not sacrifice the needs of RB CRA.
B. If the specifications list a vendor or manufacturer, the contractor may submit a written request for a substitution. This applies if one or more vendors or manufacturers are listed (May include a statement "or approved equal" or "Engineer and Owner approved."
C. All request for "approved equal" shall be in writing on the PBSC form with the proper back-up information:
   1. Product literature/specifications with warranty information.
   2. Product approval or evaluation from Florida Building Code approved agency.
   3. List of five local projects and contacts with this product installed.
D. The Owner and A/E shall review the request and either approve or deny the request in writing.
   1. The Commissioning Authority may, upon request by the Owner, advise the Owner on the technical and operations & maintenance impacts of the request.
E. The Contractor shall not use the proposed substitution in the bid, unless the Owner and A/E approve the request in writing.

PART 2 PRODUCTS

2.1 Not Used.

PART 3 EXECUTION
3.1 Contractor shall submit request for substitution of non RB CRA Standard items to the Architect/Engineer for their review.

3.2 The Architect/Engineer shall review Contractors information and request then make recommendation to the RB CRA’s Project Manager.

3.3 Submit all Architect approved substitutions to the Riviera Beach Building Department for review and approval to Code requirements.
   A. Submittals to the Building Department require Architect or the Engineer’s recommendation approvals.

3.4 If Contractor chooses to install substitutions prior to RB CRA’s approval, he does so at his own risk.
   A. Contractor shall be responsible for the cost of changing back to the RB CRA’s specification.

END OF SECTION
SECTION 01 70 00 – EXECUTION AND CLOSEOUT REQUIREMENTS

PART I – GENERAL

1.01 SECTION INCLUDES

A. Summary – Contract Closeout Process
B. Prerequisites To Substantial Completion
C. Prerequisites to Final Payments
D. Final Cleaning
E. Punch List – Substantial Completion
F. Charts and Locations of Concealed Work
G. As-Built Survey / Flood Certification Form
H. Maintenance and Operating Manuals
I. Spare Parts and Maintenance Products
J. Warranties and Bonds
K. Project Record Documents
L. Maintenance Service
M. Project Close-out Form

1.02 SUMMARY

A. Contract Closeout is hereby defined to include all General Condition requirements near the end of the Contract Time, in preparation for final acceptance and occupancy by the Owner, including final payment, normal termination of the Contract, and similar actions evidencing completion of the Work. Specific requirements for individual parts of the Work are specified in Sections of Division 2 through 16. The process of closeout is directly associated to the prerequisite process of Substantial Completion and the issuance of a Substantial Completion Certificate.

1.03 PREREQUISITES TO SUBSTANTIAL COMPLETION

A. Substantial Completion is the stage when the Work or designated portion is sufficiently complete in accordance with the Contract Documents so that the Owner can occupy or utilize the Work for its intended use.

B. Prior to requesting the Architect to review the project for a Certificate of Substantial Completion, (for either the entire Work or portions thereof), the Contractor shall complete a comprehensive punch list of items yet completed or corrected, prior to a request for a project review. Failure to include an item on such a list does not alter the responsibility of the Contractor to complete the entire Work in the Contract Documents:

1. Upon receipt of the Contractor’s punch list, the Architect will make one (1) site / building observation to determine whether the Work is substantially complete.
2. If determined substantially complete, the Architect will issue a Certificate, which shall establish the date of responsibility of the Owner for security, maintenance and insurance, etc. Warranties shall commence on said date.
3. If the Work is not deemed ready for a Substantial Completion Certificate, any re-inspection and the direct and indirect costs expended by the Architect / Engineer will be paid to the Architect / Engineer as a charge-back to the Contractor, through the Owner.
4. Contractor to advise The Owner of pending insurance changeover requirements.
5. Submit specific warranties, workmanship/maintenance bonds / maintenance agreements, and other required closeout documents in draft form, for review by the Architect and the Owner.

6. Obtain and submit releases enabling the Owner full and unrestricted use of the Work and access to services and utilities, including occupancy permits, operating...
1.04 PREREQUISITES TO FINAL PAYMENTS

A. Subsequent to the Substantial Completion Certificates and prior to requesting the Architect for a final review for Certification of Final Payment, the Contract shall adhere to and complete the following:

1. Refer to the General Conditions and all inclusive requirements.
2. Submit a Final Punch List of itemized Work to be completed or corrected, stating that each and every item has been completed or otherwise resolved for acceptance.
3. Submit “Project Record Copy” drawings on three (3) CD duplicate disks, pdf. format, maintenance manuals (3.04), and similar final record information as required by the Architect.
4. Submit certification of code compliance on Contractor’s letterhead.
5. Submit certification stating that no materials containing asbestos were incorporated into the Work on Contractor’s letterhead.
6. Submit certification on Contractor’s letterhead stating that no flux or solder, used for drinking water containing more than 0.2 percent lead, and that no pipe or fittings used for drinking water piping contained no more than 0.8 percent lead.
7. Submit written certification on Contractor’s letterhead that the contract documents were reviewed, Work inspected, and that Work is complete in accordance with contract documents and the Work is ready for the Owner and Architect final review. The written certification shall include documentation verifying all required Commissioning (if required) and Functional Performance Testing Procedures were successfully completed and that all issues are resolved.
8. Complete final clean-up requirements as specified in herein (1.05).
9. Submit all warranties, spare parts and maintenance products as required by the Contract Documents.
10. Provide all submittals, permits and approvals to the Architect and Owner that are required by governing or other authorities.
11. Make final changeover of locks and transmit keys to Owner and advise the Owner’s personnel of changeover in security provisions. A written receipt form the Owner is required.
12. Complete start-up testing of systems and instructions of the Owner operating/maintenance personnel. Discontinue and remove from project site temporary facilities and service, construction tools and facilities, mock-ups, and other construction elements.
13. Submit Test and Balance Report (15950), thirty (30) days prior to the Application for Final Payment
14. Submit completed Project Closeout Form (see 8 of 8) Exhibit “A”
15. Submit Application for Final Payment identifying total adjusted contract sum, previous payments, and sum remaining due to close-out the project.

1.05 FINAL CLEANING

A. The Contractor shall perform two (2) final cleans and leave the Work of the complete Project in a clean, neat condition prior to Substantial and Final Stages. The following are examples, but not by way of limitation, of cleaning levels required. The first clean will be required at the Substantial Completion Certificate Stage and the second fifteen (15) days prior to the Application for Final Payment.

1. Remove labels which are not required labels.
2. Clean transparent materials, including mirrors and window/door glass, to a polished condition, removing substances which are noticeable as vision-obscuring materials. Replace broken glass and damaged transparent materials.
3. Clean exposed exterior and interior hard surfaces to a dirt free condition, free of dust, stains, films, and similar noticeable distracting substances. Except as otherwise indicated, avoid disturbance of natural weathering of exterior surfaces. Restore reflective surfaces to original reflective conditions.

4. Wipe surfaces of mechanical and electrical equipment clean; remove excess lubrication and other surfaces.

5. Remove debris and surface dust from limited access spaces including roofs, plenums, shafts, trenches, equipment vaults, manholes, attics and similar spaces.


7. Vacuum clean carpeted surfaces and similar soft surfaces.

8. Clean plumbing fixtures to a sanitary condition, free of stains, including those resulting from water exposure.

9. Clean food service equipment (if in the project) to a condition, free of stains; including those resulting from water exposure.

10. Clean light fixtures and lamps so as to function will full efficiency.

11. Clean project site (yard and grounds), including landscape development areas, of litter and foreign substances. Sweep paved areas to a broom clean condition; remove stains, petro-chemical spills, and other foreign deposits. Rake grounds which are neither planted nor paved to a smooth, even textured surface.

PART 2 – PRODUCTS (NOT USED)

PART 3 - EXECUTION

3.01 PUNCH LIST - SUBSTANTIAL COMPLETION

A. Prior to the Architect's observation for Substantial Completion, the contractor shall prepare a written preliminary punch list 14 days in advance to any requested date and submit to the Architect.

B. The preliminary punch list shall be as thorough as possible to provide a first-class Workmanship project and shall include the standard of performance established in the Construction Documents for the Work, including that of the subcontractors.

C. Upon receipt of the preliminary punch list, the Architect shall observe the Work, providing that the Work has been completed to the condition represented and prepared for use by contractors and their subcontractors.

3.02 CHARTS AND LOCATIONS OF CONCEALED WORK

A. Prepare charts identifying and locating each concealed control or other concealed item requiring future repair, adjustment, and maintenance. Charts shall be mounted in suitable frames with glass covers secured to wall where directed by the Owner.

B. Charts shall list each item, together with its function, item number and location.

C. Locations throughout the building shall be identified on the wall or ceiling by permanent, non-obstructive plates, labels, or other approved means secured in a permanent manner, as directed by the Owner.

3.03 AS-BUILT SURVEY / FLOOD CERTIFICATION FORM

A. Upon completion of all site construction improvements, provide the Architect and the Owner with a final complete and accurate field survey prepared, signed and sealed by a Florida registered surveyor.
1. Exact horizontal and vertical location relative to property lines and NGVD of buildings, concrete and asphalt surfaces and all drainage features, including lakes, detention areas, berms, embankments and swales.

2. The actual grades of the spot elevations shown on the paving and drainage plans.

3. Provide sufficient information indicating a true representation of constructed grade conditions for areas where grading between two elevation points is not constructed at a uniform slope.

4. Survey shall include cross sections elevations at 50’ stations of swales, lakes and drainage retention areas including banks, berms, bottoms, and transitions constructed or improved.

5. Elevations shown shall be accurate to the nearest tenth of a foot.

B. Upon completion of all site construction improvements, provide as required, the Architect and the Owner with a complete and accurate FEMA Flood Certifications form (FEMA 81-31) prepared, signed and sealed by a Florida registered surveyor.

3.04 MAINTENANCE AND OPERATING MANUALS

A. Prior to submittal of the Application for Final Payment, the Contractor shall submit to the Architect four (4) copies of the Maintenance and Operating Manuals, presenting complete directions and recommendations for the proper care and maintenance of visible surfaces and operating systems, as well as maintenance and operating instructions for equipment items as required in the Construction Documents. Operation and Maintenance Manuals shall include and be organized as follows:
   1. Schematic and piping and wiring diagrams
   2. Valve charts and schedules
   3. Lubrication charts and schedules
   4. Guides for troubleshooting
   5. Pertinent diagrams of equipment with main parts identification
   6. Manufacturer’s data on all equipment
   7. Operating and maintenance instructions for all equipment
   8. Manufacturer’s parts list
   9. Any testing procedures for operating tests
   10. Roof maintenance manual as specified in Division 7
   11. Photographic record of significant systems control locations and operations.

B. Operating instructions shall include necessary printed directions for correct operations, adjustments, servicing, and maintenance of moveable parts. Also, included shall be suitable parts lists, approved shop drawings, diagrams showing parts location and assembly.

C. Finished manuals shall be loose-leaf type with hardboard covers and titled tabs identifying each particular portion or item of the Work.

D. For each title item or portion of the Work, manual, must provide the names, addresses, and phone numbers of the following parties:
   1. Contractor/installer
   2. Manufacturer
   3. Nearest dealer/supplier
   4. Nearest agency capable of supplying parts and service
E. For each manual label on front cover or spline, indicate the following information:
   1. Project name and address
   2. Manufacturer
   3. Name and address of Architect
   4. Name and address of all contractors and their contacts
   5. Date of submission

F. The Contractor shall instruct the Owner operating personnel in the proper use, care and emergency repair of all equipment installed before final payment. The Contractor shall call particular attention to any safety measures that should be followed. The instruction shall be adequate to train the Owner operating personnel in the proper use, care, and emergency repair of such equipment. The Contractor is required to include a sign-off from all supervisor personnel on all systems for the training process. The Owner will inform the construction of the responsible personnel.

3.05 SPARE PARTS AND MAINTENANCE PRODUCTS

A. Provide spare parts, maintenance, and extra products in quantities specified in this specification.

B. Deliver to the Owner and obtain receipt prior to the Application for Final Payment and present as a submittal to the Architect.

3.06 WARRANTIES AND BONDS

A. Refer to the General Conditions, the Owner requirements and all Contract Documentation requirements.

B. Provide three (3) notarized copies and deliver to Architect.

C. Execute and assemble transferable warranty documents from subcontractors, suppliers, and manufacturers.

D. Provide Table of Contents and assemble in 3-ring binders with durable plastic cover.

3.07 PROJECT RECORD DOCUMENTS

A. The Contractor shall keep current, during the progress of the Work, Project Record Drawings and submit these at the completion of the project. Drawings shall incorporate changes made in the Work of the respective trades at least weekly during the construction period and/or at the time they occur for accuracy. The Contractor shall convert the project record drawings to CD-AutoCAD (.dwg) prior to the Application for Final Payment.

B. Maintain at the job site, one copy of Drawings, Project Manual, Addenda, approved shop drawings, change orders, field orders, other Contract modifications, and other approved documents submitted by the contractor(s), in compliance with various Sections of the Contract Documents.

C. During the construction of the Work, each of these Project Record Documents shall be clearly marked, “Project Record Copy”; maintained in good condition; available for observation by the Architect; and shall not be used for construction purposes. During the Work, the Contractor shall mark up the documents to indicate the following:
   1. Significant changes and selections made during the construction process;
   2. Significant detail not shown in the original Contract Documents, including change orders;
   3. The location of underground utilities and appurtenances dimensionally referenced to permanent surface improvements;
4. The location of internal utilities and appurtenances, concealed in building structures, referenced to visible and accessible features of the structure;
5. When elements are placed exactly as shown on the Drawings, so indicate, otherwise, indicate changed location.

D. Keep Project Record Documents current. Do not permanently conceal Work until the required information has been recorded on the Project Record Documents.
E. Thirty (30) days prior to Application for Final Payment, submit to the Architect the Project Record Drawings documenting all changes recorded for the Work.
F. The Contractor shall certify on Contractor’s letterhead that the Project Record Drawings show complete and accurate as-built conditions, including without limitation, sizes, kinds of material, vital piping and valves, conduit locations, and other similar and required items.
G. Include as part of the Project Record Drawings, a complete and current Project Manual, three (3) hard copies of all drawings, one (1) CD indicating the changes made per the as-built conditions. All requirements for the Project Record Drawings apply to the Project Record Project Manual.
H. Maintain all approved Permit Drawings in a manner so as to make them accessible to governmental inspectors and other authorized agencies. All approved Drawings shall be wrapped, marked and delivered to the Owner within 10 days after the Date of Substantial Completion.

3.08 MAINTENANCE SERVICE

A. Furnish service and maintenance to all components indicated in the specifications for one-year from the date of Substantial Completion.
B. Regularly examine, clean, adjust and lubricate system components as required to ensure warranty compliance and reliable operation for one-year from the date of Substantial Completion.
C. Include systematic notification to the Owner that these services are taking place which must include systematic examination, adjustment and lubrication of component repairing or replacing parts produced by the manufacturer of the original system and / or component.
D. The Owner shall pre-approve any transfer or reassignment of maintenance service responsibilities during the one year period from the date of Substantial Completion.
EXHIBIT “A”

PROJECT CLOSEOUT FORM

All items are to be submitted seven (7) days prior to the Construction Manager’s application for final payment.

1. _____ 4 copies: AIA Application for Final Payment, Signed and Sealed, Noted as Final Payment

2. _____ Consent of Surety to make final payment.

3. _____ Release of Lien from Sub-Contractors or Laborers

4. _____ Warranty / Guarantee form Construction Manager for one-year form the date of Substantial Completion

5. _____ Warranty / Guarantee from each Sub-Contractor for one year from the date of Substantial Completion

6. _____ Copy of the approval by the Architect-Engineer and the transmittal to the end of use of manuals, shop drawings, as builds, brochures, warranties, and list of sub-contractors with phone numbers, addresses, and contact persons.

7. _____ Written verification that all applicable the Owner personnel have been trained in the operation of their new equipment (per system: HVAC controls, etc.)

8. _____ Executed Roof Warranty(s)

9. _____ Two CD (s) of the original permitted drawings and the final as-built drawings.

10. _____ One CD copy of the complete RFI and Submittal Log

11. _____ One CD copy of the job site log book.

12. _____ One copy of all shop drawings, product data and samples for the Owner.

13. _____ Deliver spare parts and maintenance products.

14. _____ 4 Copies: Completed Punch-List

15. _____ Test and Balance Report complete with the MEP Engineer of Record Sign-Off (15950 Tab)

END OF SECTION
SECTION 01 72 29 - CUTTING AND PATCHING

PART 1 GENERAL

1.1 SECTION INCLUDES

A. The requirements and limitations for cutting and patching of work.

1.2 SUBMITTALS

A. Submit written request in advance of cutting or alteration, which affects:
   1. The structural integrity of any element of project.
   2. Interruption of power and/or utilities.
   3. The integrity of weather-exposed or moisture-resistant element.
   4. The efficiency, maintenance, or safety of any operational element.
   5. Visual qualities of sight exposed elements.
   6. Work of Owner or separate contractor.

B. Include in request:
   1. The identification of project.
   2. The location and description of affected work.
   3. The necessity for cutting or alteration.
   4. A description of proposed work, and products.
   5. Any possible alternatives to cutting and patching.
   6. Any effect on work of Owner or separate contractor.
   7. Written permission from affected separate contractor(s).
   8. Proposed date and time the work starts.

1.3 Quality Control

A. Perform invasive and noninvasive investigation through appropriate equipment of concealed/under-slab utilities to quantify conditions and ensure safety prior to cutting.

PART 2 PRODUCTS

2.1 MATERIALS

A. Primary Products: Those required for original installation.
B. Product Substitution: For any proposed change in materials, submit request for substitution described in Section 01 60 00.

PART 3 EXECUTION

3.1 EXAMINATION

A. Examine existing conditions prior to commencing work, including elements subject to damage or movement during cutting and patching.
B. After uncovering existing work, assess conditions affecting performance of work.
C. Beginning of cutting or patching means acceptance of existing conditions.
3.2 PREPARATION
   A. Provide temporary supports to ensure structural integrity of the work.
      1. Provide devices and methods to protect other portions of project from damage.
   B. Provide protection from elements for areas, which may be exposed by uncovering work.
   C. Maintain excavations free of water.

3.3 CUTTING
   A. Execute cutting and fitting including excavation and fill to complete work.
   B. Uncover work to install improperly sequenced work.
   C. Remove and replace defective or non-conforming work.
   D. Remove samples of installed work for testing when requested.
   E. Provide openings in the work for penetration of mechanical and electrical work.
   F. Employ skilled and experienced installer to perform cutting for weather exposed and moisture resistant elements, and sight-exposed surfaces.
   G. Cut rigid materials using masonry saw or core drill.
      1. Pneumatic tools not allowed without prior approval.

3.4 PATCHING
   A. Execute patching to complement adjacent work.
   B. Properly fit products together to integrate with other work.
   C. Execute work by methods to avoid damage to other Work, and which will provide appropriate surfaces to receive patching and finishing.
   D. Employ original installer to perform cutting and patching for weather exposed and moisture resistant elements, and sight-exposed surfaces.
   E. Restore work with new products in accordance with requirements of Contract Documents.
   F. Fit work air tight to pipes, sleeves, ducts, conduit, and other penetrations through surfaces.
   G. At penetrations of fire rated walls, partitions, ceiling, or floor construction, completely seal voids with fire rated material, to full thickness of the penetrated element.
   H. Refinish surfaces to match adjacent finish.
      1. For continuous surfaces, refinish to nearest intersection or natural break.
      2. For an assembly, refinish entire unit.

END OF SECTION
SECTION 01 74 19 – CONSTRUCTION WASTE MANAGEMENT AND DISPOSAL

PART 1 GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other sections of Division 1 – GENERAL REQUIREMENTS, apply to this Section.

1.2 SUMMARY

A. This Section includes administrative and procedural requirements for the following.

1. Special requirements for waste management during deconstruction and construction operation.
   a. Protect the environment, both on-site and off-site, during deconstruction and construction operations.
   b. Prevent environmental pollution and damage.
   c. Maximize source reduction, reuse and recycling of solid waste.

B. Related Sections:

1. Divisions 01 through 16 Sections for environmental protection measures and waste management requirements specific to the work of each of these Sections. Requirements may or may not include reference to LEED.

1.3 DEFINITIONS

A. Definitions pertaining to sustainable development: As defined in ASTM E2114.

B. Construction Waste: Building and site improvement materials and other solid waste resulting from construction, remodeling, renovation, or repair operations. Construction wastes include packaging.

C. Demolition Waste: Building and site improvement materials resulting from demolition or selective demolition operations.

D. Disposal: Removal off-site of construction and demolition waste and subsequent sale, recycling, reuse, or deposit in landfill or incinerator acceptable to authorities having jurisdiction.

E. Recycle: Recovery of demolition or construction waste for subsequent processing in preparation for reuse.

F. Salvage: Recovery of demolition or construction waste and subsequent sale or reuse in another facility.

G. Salvage and Reuse: Recovery of demolition or construction waste and subsequent incorporation into the Work.
1.4 PERFORMANCE GOALS

A. General: Develop and implement waste management plan that results in end-of-project rates for salvage and recycling of at a minimum 50 percent by weight of total waste generated by the Work.

1.5 SUBMITTALS

A. Waste Management Plan: Not less than 10 days before the Pre-construction meeting, prepare and submit 3 copies of a Waste Management Plan, including, but not limited to, the following:
   1. List of the recycling facilities, reuse facilities, municipal solid waste landfills and other disposal area(s) to be used. Include:
      a. Name, location, and phone number.
      b. Copy of permit or license for each facility.
   2. Identify materials that cannot be recycled or reused. Provide explanation or justification.
   3. Revise and resubmit Plan as required by Owner.
      a. Approval of Contractor’s Plan will not relieve the Contractor of responsibility for compliance with applicable environmental regulations.

B. Waste Reduction Progress Reports: Concurrent with each Application for Payment, submit 3 copies of report. If applicable, include separate reports for demolition and construction waste.
   1. The progress report shall at a minimum include the following information:
      b. Generation point of waste.
      c. Total quantity of waste in tons.
      d. Quantity of waste salvaged, both estimated and actual in tons.
      e. Quantity of waste recycled, both estimated and actual in tons.
      f. Total quantity of waste recovered (salvaged plus recycled) in tons.
      g. Total quantity of waste recovered (salvaged plus recycled) as a percentage of total waste.

C. Record submittals:
   1. Waste Reduction Calculation:
      a. Before request for Substantial Completion, submit 5 copies of calculated end-of-Project rates for recycling and disposal as a percentage of total waste generated by the Work.
   2. Record of Donations:
      a. Indicate receipts and acceptance of salvageable waste donated to individuals and organizations.
      b. Indicate whether organization is tax exempt.
   3. Record of Sales:
      a. Indicate receipt and acceptance of salvageable waste donated to individuals and organizations.
      b. Indicate whether organization is tax exempt.
   4. Recycling and Processing Facility Record:
      a. Indicate receipt and acceptance of recyclable waste by recycling and waste processing facilities licensed to accept them.
      b. Include manifests, weight tickets, receipts and invoices.
5. Landfill and Incinerator Disposal Records:
   a. Indicate receipt and acceptance of waste by landfills and/or incinerator facilities licensed to accept them.
   b. Include manifest, weight tickets, receipts and invoices.
6. Statement of Refrigerant Recovery:
   a. Signed by refrigerant recovery technician responsible for recovering refrigerant, stating that all refrigerant present was recovered according to EPA regulations. Include name and address of technician and date when refrigerant was recovered.

D. LEED Documentation:
   1. Complete letter template for Credit MR 2 under LEED and submit it through LEED-Online.
   2. Provide record submittals as supporting documentation.

1.6 QUALITY ASSURANCE

A. Waste Management Coordinator:
   1. Assign a waste management coordinator to ensure the implementation of waste management plan.
   3. Waste management coordinator may serve as the LEED coordinator of the construction team.

B. Regulatory requirements: Comply with hauling and disposal regulations of authorities having jurisdiction.

1.7 PRECONSTRUCTION MEETING

A. After award of Contract and prior to the commencement of the Work, schedule and conduct meeting with Owner and Architect to discuss the proposed Waste Management Plan and to develop mutual understanding relative to details of environmental protection. Review methods and procedures including, but not limited to, the following:
   1. Review and discuss waste management plan including responsibilities of Waste Management Coordinator.
   2. Review requirements for documenting quantities of each type of waste and its disposition.
   3. Review and finalize procedures for materials separation and verify availability of containers and bins needed to avoid delays.
   4. Review procedures for periodic waste collection and transportation to recycling and disposal facilities.
   5. Review waste management requirements for each trade.

1.8 WASTE MANAGEMENT PLAN

A. General: Develop plan consisting of waste stream identification, waste reduction work plan, and cost/revenue analysis. Indicate quantities by weight.

B. Waste stream identification: Indicate anticipated types and quantities of construction and demolition waste generated by the Work. Include estimated quantities and assumptions for estimates. The anticipated waste types are usually from the following list:
1. Land clearing debris.
2. Asphalt.
3. Concrete and Masonry.
4. Metal.
   a. Ferrous.
   b. Non-ferrous.
5. Wood, nails and staples allowed.
6. Debris.
7. Glass, colored glass allowed.
8. Paper
   a. Bond.
   b. Newsprint.
   c. Cardboard and paper packaging materials.
9. Plastic:
   a. Type 1: Polyethylene Terephthalate (PET, PETE).
   b. Type 2: High Density Polyethylene (HDPE).
   c. Type 3: Vinyl (Polyvinyl Chloride or PVC).
   d. Type 4: Low Density Polyethylene (LDPE).
   e. Type 5: Polypropylene (PP).
   f. Type 6: Polystyrene (PS).
   g. Type 7: Other. Use of this code indicates that the package in question is made with a resin other than the six listed above, or is made of more than one resin listed above, and used in a multi-layer combination.
10. Gypsum.
11. Non-hazardous paint and paint cans.
12. Carpet.
13. Insulation.
14. Others as appropriate.

C. Waste Reduction Work Plan: List each type of waste and whether it will be salvaged, recycled or disposed of in landfill or incinerator. Include points of waste generation, total quantity of each type of waste, quantity for each means of recovery, and handling and transportation procedures.
1. Salvaged Materials for Reuse: For materials that will be salvaged and reused in the Project, describe methods for preparing salvaged materials before incorporation into the Work.
2. Salvaged Materials for Sale: For materials that will be sold to individuals and organizations, include list of their names, addresses, and telephone numbers.
3. Salvaged Materials for Donation: For materials that will be donated to individuals and organizations, include list of their names, addresses, and telephone numbers.
4. Recycled Materials: Include list of local receivers and processors and type of recycled materials each will accept. Include names, addresses, and telephone numbers.
5. Disposed Materials: Indicate how and where materials will be disposed of. Include name, address, and telephone number of each landfill and incinerator facility.
6. Handling and Transportation Procedures: Include method that will be used for separating recyclable waste including size of containers, container labeling, and designated location on Project site where materials separation will be located.
D. Cost/Revenue Analysis: Indicate total cost of waste disposal as if there was no waste management plan and net additional cost or net savings resulting from implementation of waste management plan. Include the following:
1. Total quantity of waste.
2. Estimated cost of disposal (cost per unit). Include hauling and tipping fees and cost of collection container for each type of waste.
3. Total cost of disposal (with no waste management).
4. Revenue from salvaged materials.
5. Revenue from recycled materials.
7. Savings in hauling and tipping fees that are avoided.
8. Handling and transportation costs. Include cost of collection containers for each type of waste.
9. Net additional cost or net savings from implementing waste management plan.

PART 2 PRODUCTS (Not Used)

PART 3 EXECUTION

3.1 PLAN IMPLEMENTATION

A. General: Implement waste management plan as approved by Architect and Construction Manager.
1. Provide handling containers, storage, signage, transportation, and other items as required during the entire duration of the Contract.
2. Comply with Division 1 Section "Temporary Facilities and Controls" for operation, termination, and removal requirements.

B. Waste Management Coordinator: Engage a waste management coordinator to be responsible for implementing, monitoring, and reporting status of waste management plan. The Coordinator shall be present at the Project site full time during the construction of the Project.

C. Training: Train workers, subcontractors, and suppliers on proper waste management procedures, as appropriate for the Work at Project site.
1. Distribute waste management plan to everyone involved within 3 days of submittal return.
2. Distribute waste management plan to workers, subcontractors or suppliers when they first begin work onsite. Review procedures and locations established for salvage, recycling and disposal.

D. Site Access and Temporary Controls: Conduct waste management operations to ensure minimum interference with roads, streets, walkways, and other adjacent occupied or used facilities.
1. Designate and label specific areas on Project site necessary for separating materials that are to be salvaged, recycled, reused, donated, and sold.
2. Comply with Division 01 Section “Temporary Facilities and Controls” for controlling dust and dirt, environmental protection, and noise control.
3.2 RECYCLING CONSTRUCTION AND DEMOLITION WASTE

A. General: Recycle paper and beverage containers used by on-site workers.

B. Recycling Incentives: Revenues, savings, rebates, tax credits, and other incentives received for recycling waste materials shall be shared equally by Owner and Contractor.

C. Procedures: Separate recyclable waste from other waste materials, trash, and debris. Separate recyclable waste by type at Project site to the maximum extent possible.
   1. Provide containers or bins marked appropriately for collection of recyclable waste until removal from Project site. Include list of acceptable and unacceptable materials at each container and bin.
      a. Inspect containers and bins for potential contamination. If contamination is found, remove contaminated materials.
   2. Stockpile processed materials on-site without comingling with other materials. Place, grade and shape stockpiles to drain surface water. Cover to prevent windblown dust.
   3. Stockpile materials away from construction area. Do not store within drip line of remaining trees.
   4. Store components off the ground and protect from the weather.
   5. Remove recyclable waste off Owner’s property and transport to recycling receiver or processor.

D. Asphalt Concrete Paving: Grind asphalt to maximum 1 ½ inch size.
   1. Crush asphaltic concrete paving and screen to comply with requirements in Division 31 Section “Earth Moving” for use as general fill.
   2. Break up and transport paving to asphalt recycling facility; or on-site processing if applicable.

E. Concrete: Remove reinforcement and other metals from concrete and sort with other metals.
   1. Pulverize concrete to maximum 1 ½ inch size.
   2. Crush concrete and screen to comply with requirements in Division 31 Section “Earth Moving” for use as satisfactory soil for fill or sub-base.

F. Packaging:
   1. Cardboard and Boxes: Break down packaging into flat sheets. Bundle and store in a dry location.
   3. Pallets: As much as possible, require deliveries using pallets to remove pallets from Project site. For pallets that remain onsite, break down pallets into component wood pieces and comply with requirements for wood recycling.
   4. Crates: Break down crates into component wood pieces and comply with requirements for wood recycling.

G. Wood Materials:
   1. Clean Cut-Offs of Lumber: Grind or chip into small pieces.
   2. Clean Sawdust: Bag sawdust that does not contain painted or treated wood.
      a. Comply with requirements in Division 32 Section “Plants” for use of clean sawdust as organic mulch.
H. Gypsum Boards:
1. Stack large clean pieces on wood pallets and store in a dry location.
2. Grind scraps of clean gypsum board using small mobile chipper or hammer mill.
   Screen out paper after grinding.
   a. Comply with requirements in Division 32 Section “Plants” for use of clean ground gypsum board as inorganic soil amendment.

3.3 DISPOSAL OF WASTE

A. General: Except for items or materials to be salvaged, recycled, or reused otherwise, remove waste materials from Project site and legally dispose of them in a landfill or incinerator acceptable to authorities having jurisdiction.
1. Except as otherwise specified, do not allow waste materials that are to be disposed accumulated onsite.
2. Remove and transport debris in a manner that will prevent spillage on adjacent surfaces and areas.
3. Burning: Burning waste materials is prohibited.
4. Disposal: Transport waste materials off Owner’s property and legally dispose of them.

END OF SECTION
SECTION 01 78 23 - OPERATION AND MAINTENANCE DATA

PART 1 GENERAL

1.1 SECTION INCLUDES:

A. Format and content of manuals.
B. Instruction of Owner's personnel.
C. Schedule of submittals.

1.2 QUALITY ASSURANCE

A. Prepare instructions and data by personnel experienced in maintenance and operation of described products.
B. Coordinate with Section 01 91 00-Commission. The Commissioning Agent shall review the Operation and Maintenance Manuals for systems that were commissioned.

1.3 FORMAT

A. Prepare data in the form of an instructional manual and .PDF electronic from documents on (2) compact disks:
B. Prepare data in electronic format and submit on CD or DVD.
   1. Submit four (4) copies of the CD or DVD
   2. When multiple disks are used, correlate data into related consistent groupings.
C. Cover: Identify each binder with typed or printed title OPERATION AND MAINTENANCE INSTRUCTIONS; identify title of project; identify subject matter of contents.
D. Provide tabbed dividers for each separate product and system, with typed description of product and major component parts of equipment.
E. Text: Manufacturer's printed data, or typewritten data.
F. Drawings: Provide with reinforced punched binder tab; fold larger drawings to size of text pages.
G. Prepare a table of contents for each volume, with each product or system description identified, in three parts as follows:
   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.
      a. Significant design criteria.
      b. List of equipment and parts list for each component.
      c. Operating instructions.
      d. Maintenance instructions for equipment and systems.
      e. Maintenance instructions for finishes, including recommended cleaning methods and materials, and special precautions identifying detrimental agents.
   3. Part 3: Project documents and certificates, including the following:
      a. Shop drawings and product data.
      b. Air and water balance reports.
      c. Certificates and originals of warranties and bonds.

1.4 CONTENTS, EACH VOLUME

A. Provide a table of contents with title of project; names, addresses, and telephone numbers of Architect, Sub-consultants, and Contractor with name of responsible parties; schedule of products and systems, indexed to content of the volume.
B. For each product or system list names, addresses and telephone numbers of Subcontractors and suppliers, including local source of supplies and replacement parts. (minimum of 2 each)
C. Product data mark each sheet to clearly identify specific products and component parts, and data applicable to installation, delete inapplicable information.

D. Drawings supplement product data to illustrate relations of component parts of equipment and systems, to show control and flow diagrams.
   1. Do not use project record documents as maintenance drawings.

E. Typed text as required supplementing product data, providing logical sequence of instructions for each procedure, incorporating manufacturer's instructions specified in Section 01 45 00.

F. Warranties bind in copy of each as specified in Section 01 78 36.

G. Bonds bind in photocopy and original of each.

1.5 MANUAL FOR MATERIALS AND FINISHES

A. Building products, applied materials, and finishes include product data, with catalog number, size, composition, and color and texture designations.
   1. Provide information for reordering custom manufactured products.

B. Instructions for care and maintenance include manufacturer's recommendations for cleaning agents and methods, precautions against detrimental agents and methods, and recommended schedule for cleaning and maintenance.

C. Moisture protection and weather-exposed products include product data listing applicable reference standards, chemical composition, and details of installation.
   1. Provide recommendations for inspections, maintenance, and repair.

D. Additional requirements as specified in individual product specification sections.

E. Provide a listing in table of contents for design data, with tabbed flysheet and space for insertion of data.

1.6 MANUAL FOR EQUIPMENT AND SYSTEMS

A. Refer to Section 01 91 00 – Commissioning for additional requirements concerning Systems Operations & Maintenance Manuals.

B. For each item of equipment and each system include description of unit or system, and component parts identifying function, normal operating characteristics, and limiting conditions.
   1. Include performance curves, with engineering data and tests, and complete nomenclature and model number of replaceable parts.

C. Panelboards circuit directories provide electrical service characteristics, controls and communications by label machine.
   1. Include color-coded wiring diagrams as installed.

D. Operating procedures include:
   1. Startup, break-in, and routine normal operating instructions and sequences.
   2. Regulation, control, stopping, shut-down, and emergency instructions.
   3. Summer, winter, and any special operating instructions.

E. Maintenance Requirements include routine procedures and guide for preventative maintenance and troubleshooting; disassembly, repair, and reassembly instructions; and alignment, adjusting, balancing, and checking instructions.

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

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

H. Include sequence of operation by controls manufacturer.

I. Provide original manufacturer's parts list, illustrations, assembly drawings, and diagrams required for maintenance.

J. Provide control diagrams by controls manufacturer as installed.

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

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

M. Provide list of original manufacturer's spare parts, current prices, and recommended quantities to keep on hand.

N. Additional Requirements as specified in individual product specification sections.
O. Provide a listing in table of contents for design data, with tabbed dividers and space for insertion of data.

1.7 INSTRUCTION OF OWNER PERSONNEL

A. See Section 01 91 00 – "Commissioning" for requirements on Instruction of Owner Personnel.
B. Before final inspection, instruct Owner's designated personnel in operation, adjustment, and maintenance of products, equipment, and systems, at agreed upon times.
C. Equipment requiring seasonal operation perform instructions for other seasons within six months.
D. Use operation and maintenance manuals as basis for instruction.
E. Review contents of manual with personnel in detail to explain all aspects of operation and maintenance.
F. Prepare and insert additional data in "Operation and Maintenance" manual when need for such data becomes apparent during instruction.

1.8 SUBMITTALS

A. Submit two copies of preliminary draft with proposed formats and outlines of contents before start of work for Architect, Commissioning Authority, and Engineer to review and return one copy with comments.
B. For equipment, or component parts of equipment put into service during construction and operated by Owner, submit documents within ten days after placing equipment into service.
C. Submit Preliminary Draft copy of Operations and Maintenance Manual within 30 days after approval of equipment submittal include the following:
   1. Table of Contents showing proposed sections.
   2. Equipment submittal data
   3. Manufacturer's Installation Manual clearly marked showing the proposed equipment.
   4. Manufacturer’s Operations and Maintenance Manual clearly marked showing proposed equipment model.
   5. Manufacturer’s recommended spare parts lists.
D. Submit two final draft copies of completed volumes fifteen days prior to scheduled Functional Performance Testing, the Architect/Engineer and Commissioning Authority will return with comments after functional performance testing.
   1. Revise content of all document sets as required prior to final submission.
   2. Final Draft Operations and Maintenance Manuals will include updated information from the Preliminary Draft Operations and Maintenance Manuals.
   3. Final Draft Operations and Maintenance Manuals will include System Sequence of Operations, including all setpoints, as approved prior to Functional Performance Testing.
E. Submit two sets of Final Operations and Maintenance Manuals, within ten days after final inspection at least fifteen days prior to substantial completion.
F. The Final Operations and Maintenance Manuals will incorporate review comments from the Owner, Commissioning Authority and Architect/Engineer.
H. See Section 01 91 00 – Commissioning for requirements on Submittals of Operation & Maintenance Data.

1.9 INSPECTION REQUIREMENTS

A. Inspection Requirements: Describe inspection schedule and procedures necessary to promote durability of materials, components, and systems. Include the following:
   2. Equipment: Seasonal inspection of equipment. Coordinate with Section 01 91 00-Commissioning.
1.10 ENVIRONMENTAL REQUIREMENTS

A. Environmental Requirements:
   1. Identify environmental preferable materials and systems incorporated into the project. Include:
      Products model, manufacturer’s name, address, phone, and website; and local technical representative, if any.
      a. Verify that plastic products to be incorporated into the project are labeled in accordance with ASTM D1972. Where products are not labeled, provide product data indicating polymeric information in operation and Maintenance Manual.
         1. Type 1: Polyethylene Terephthalate (PET, PETE).
         2. Type 2: High Density Polyethylene (HDPE).
         3. Type 3: Vinyl (Polyvinyl Chloride or PVC)
         4. Type 4: Low Density Polyethylene (LDPE).
         5. Type 5: Polypropylene (PP).
         6. Type 6: Polystyrene (PS)
         7. Type 7: Other. Use of this code indicates that the package in question is made with a resin listed above, and used in a multi-layer combination
      b. Describe maintenance procedures associated with environmentally preferable materials and systems. Provide cleaning recommendations in accordance with ASTM E1971
         1. Include potential environmental impacts of recommended maintenance procedures and materials.
         2. Include potential indoor air quality impacts of the recommended maintenance procedures and materials.
         3. Where the proposed maintenance procedures incorporate composting of plastics, assess the potential effect of each type of plastic to be included on the composting process in accordance with ASTM D5509 or ASTM D5512.
      c. Identify maintenance agreements and appropriate contact information for the following.
         1. Carpet
         2. Ceiling tile
         3. Office Equipment
      d. Materials Safety Data Sheets: Include MSDS as specified in Section 01 51 19, Section 01 60 00 and Division 2-23.
   2. Develop Environmental Management Programs for facility as follows:
      b. IAQ Management program: Provide for evaluation of indoor Carbon Dioxide concentrations in accordance with ASTM D6245. Provide for evaluation of VOC (volatile organic compounds) in indoor air in accordance with ASTM D6345
      c. Water management program: Develop a water monitoring program for surface and ground water on the project site in accordance with ASTM D5851 and consistent with the water management program utilized during construction operations.

PART 2 PRODUCTS

2.1 Not Used.

PART 3 EXECUTION

3.1 Not Used.

END OF SECTION
SECTION 01 78 36 - WARRANTIES

PART 1 GENERAL

1.1 SECTION INCLUDES:

A. Preparation and submittal of warranties.
B. Time and schedule of submittals.

1.2 FORM OF SUBMITTALS

A. Provide all warranty information in electronic form on compact disk (CD), provide two copies.
B. Provide CD's labeled WARRANTIES, with project number and title, name of responsible company principal, address and telephone number of Contractor and equipment supplier.
C. Prepare table of contents in the same sequence as the Project Manual, each item with the number and title of the correct specification section, and the product name.
D. Separate each warranty with index tab sheets keyed to the table of contents listing.
E. Provide full information on CD as necessary listing subcontractor, supplier, and manufacturer, with name, address, and telephone number of responsible company principal.

1.3 PREPARATION OF SUBMITTALS

A. Provide the responsible subcontractors, suppliers, and manufacturers' warranties in duplicate, within ten days after completion of the applicable item of work.
   1. Warranty shall be on the company's original forms signed by authorized agent only.
   2. Except for items put into use with Owner's permission, leave start date of warranty period until the Date of Substantial Completion is determined.
B. Verify that documents are in proper form, contain full information, and are notarized.
C. Co-execute submittals when required.
D. Retain warranties until time specified for submittal.
E. All of the above shall be in electronic format included on the CDs.

1.4 TIME OF SUBMITTALS

A. For equipment or component parts of equipment put into service during construction with Owner's permission, submit documents within ten days after acceptance.
B. Submit other warranties within ten days after Date of Substantial Completion, but prior to final Application for Payment.
C. For warranty items delayed beyond Date of Substantial Completion, submit within ten days after acceptance, listing the date of acceptance as the beginning of the warranty period.

PART 2 PRODUCTS

2.1 Not Used.
PART 3  EXECUTION

3.1 Warranty pre-expiration equipment review.

3.2 The Commissioning Authority shall conduct an on-site review of equipment and systems covered by warranties.
   A. This review will be scheduled approximately 2-months prior to expiration of the Warranty.
   B. The Construction Manager, Owner’s Representative, and Owner’s Operations & Maintenance representative shall accompany the Commissioning Authority during this review.
   C. The purpose of the review will be to evaluate the condition of the equipment and systems to determine if Warranty repairs of claims are necessary.
   D. The Construction Manager shall cooperate to notify the issuer of the Warranty and to schedule necessary repairs or corrective actions prior to expiration of the Warranty.

END OF SECTION
SECTION 024119 - SELECTIVE STRUCTURE DEMOLITION

PART 1 - GENERAL

1.1 RELATED DOCUMENTS
   A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY
   A. Section Includes:
      1. Demolition and removal of the selected the existing seawalls as noted and graphically represented on the architectural drawings.
      2. Salvage and storage on site of the existing pre-cast stone caps. They are to be carefully removed, storage and re-installed were the were removed from.
   B. Related Requirements:
      1. Section 011000 "Summary" for restrictions on the use of the premises, Owner-occupancy requirements, and phasing requirements.
      2. Section 015639 "Temporary Tree and Plant Protection" for temporary protection of existing trees and plants that are affected by selective demolition.
      3. Section 01 72 00 "Execution" for cutting and patching procedures.

1.3 DEFINITIONS
   A. Remove: Detach items from existing construction and legally dispose of them off-site unless indicated to be removed and salvaged or removed and reinstalled.
   B. Remove and Salvage: Carefully detach from existing construction, in a manner to prevent damage, and deliver to Owner.
   C. Remove and Reinstall: Detach items from existing construction, prepare for reuse, and reinstall where indicated.
   D. Existing to Remain: Existing items of construction that are not to be permanently removed and that are not otherwise indicated to be removed, removed and salvaged, or removed and reinstalled.

1.4 MATERIALS OWNERSHIP
   A. Unless otherwise indicated, demolition waste becomes property of Contractor.
B. Historic items, relics, antiques, and similar objects including, but not limited to, cornerstones and their contents, commemorative plaques and tablets, and other items of interest or value to Owner that may be uncovered during demolition remain the property of Owner.

1. Carefully salvage in a manner to prevent damage and promptly return to Owner.

1.5 PREINSTALLATION MEETINGS

A. Pre-demolition Conference: Conduct conference at Marina Village, 200 E 13th Street, Riviera Beach, FL 33404.

1. Inspect and discuss condition of construction to be selectively demolished.
2. Review structural load limitations of existing structure.
3. Review and finalize selective demolition schedule and verify availability of materials, demolition personnel, equipment, and facilities needed to make progress and avoid delays.
4. Review requirements of work performed by other trades that rely on substrates exposed by selective demolition operations.
5. Review areas where existing construction is to remain and requires protection.

1.6 INFORMATIONAL SUBMITTALS

A. Proposed Protection Measures: Submit report, including drawings, that indicates the measures proposed for protecting individuals and property, for environmental protection, for dust control and, for noise control. Indicate proposed locations and construction of barriers.

B. Schedule of Selective Demolition Activities: Indicate the following:

1. Detailed sequence of selective demolition and removal work, with starting and ending dates for each activity. Ensure Owner's building manager's and other tenants on-site operations are uninterrupted.
2. Interruption of utility services. Indicate how long utility services will be interrupted.
3. Coordination for shutoff, capping, and continuation of utility services.
4. Use of elevator and stairs.
5. Coordination of Owner's continuing occupancy of portions of existing building and of Owner's partial occupancy of completed Work.

C. Inventory: Submit a list of items to be removed and salvaged and deliver to Owner prior to start of demolition.

D. Pre-demolition Photographs or Video: Submit before Work begins.
E. Warranties: Documentation indicated that existing warranties are still in effect after completion of selective demolition.

1.7 CLOSEOUT SUBMITTALS
A. Inventory: Submit a list of items that have been removed and salvaged.
B. Landfill Records: Indicate receipt and acceptance of hazardous wastes by a landfill facility licensed to accept hazardous wastes.

1.8 FIELD CONDITIONS
A. Owner will occupy portions of building immediately adjacent to selective demolition area. Conduct selective demolition so Owner's operations will not be disrupted.
B. Conditions existing at time of inspection for bidding purpose will be maintained by Owner as far as practical.
C. Notify Architect of discrepancies between existing conditions and Drawings before proceeding with selective demolition.
D. Hazardous Materials: It is not expected that hazardous materials will be encountered in the Work.
E. Storage or sale of removed items or materials on-site is not permitted.
F. Utility Service: Maintain existing utilities indicated to remain in service and protect them against damage during selective demolition operations.
   1. Maintain fire-protection facilities in service during selective demolition operations.

1.9 WARRANTY
A. Existing Warranties: Remove, replace, patch, and repair materials and surfaces cut or damaged during selective demolition, by methods and with materials so as not to void existing warranties. Notify warrantor before proceeding. Existing warranties include the following:

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS
A. Regulatory Requirements: Comply with governing EPA notification regulations before beginning selective demolition. Comply with hauling and disposal regulations of authorities having jurisdiction.
B. Standards: Comply with ANSI/ASSE A10.6 and NFPA 241.
PART 3 - EXECUTION

3.1 EXAMINATION

A. Verify that utilities have been disconnected and capped before starting selective demolition operations.

B. Review record documents of existing construction provided by Owner. Owner does not guarantee that existing conditions are same as those indicated in record documents.

C. Survey existing conditions and correlate with requirements indicated to determine extent of selective demolition required.

D. When unanticipated mechanical, electrical, or structural elements that conflict with intended function or design are encountered, investigate and measure the nature and extent of conflict. Promptly submit a written report to Architect.

E. Survey of Existing Conditions: Record existing conditions by use of preconstruction photographs.

1. Inventory and record the condition of items to be removed and salvaged. Provide photographs of conditions that might be misconstrued as damage caused by salvage operations.

2. Before selective demolition or removal of existing building elements that will be reproduced or duplicated in final Work, make permanent record of measurements, materials, and construction details required to make exact reproduction.

3.2 UTILITY SERVICES AND MECHANICAL/ELECTRICAL SYSTEMS

A. Existing Services/Systems to Remain: Maintain services/systems indicated to remain and protect them against damage.

1. Comply with requirements for existing services/systems interruptions specified in Section 011000 "Summary."

B. Existing Services/Systems to Be Removed, Relocated, or Abandoned: Locate, identify, disconnect, and seal or cap off indicated utility services and mechanical/electrical systems serving areas to be selectively demolished.

1. Owner Building manager will arrange to shut off indicated services/systems when requested by Contractor.

2. If services/systems are required to be removed, relocated, or abandoned, provide temporary services/systems that bypass area of selective demolition and that maintain continuity of services/systems to other parts of building.

   a. Equipment to Be Removed: Disconnect and cap services and remove equipment.
b. Equipment to Be Removed and Reinstalled: Disconnect and cap services and remove, clean, and store equipment; when appropriate, reinstall, reconnect, and make equipment operational.

c. Equipment to Be Removed and Salvaged: Disconnect and cap services and remove equipment and deliver to Owner.

3.3 PREPARATION

A. Site Access and Temporary Controls: Conduct selective demolition and debris-removal operations to ensure minimum interference with roads, streets, walks, walkways, and other adjacent occupied and used facilities.

1. Comply with requirements for access and protection specified in Section 015000 "Temporary Facilities and Controls."

B. Temporary Facilities: Provide temporary barricades and other protection required to prevent injury to people and damage to adjacent buildings and facilities to remain.

1. Provide protection to ensure safe passage of people around selective demolition area and to and from occupied portions of building.
2. Provide temporary weather protection, during interval between selective demolition of existing construction on exterior surfaces and new construction, to prevent water leakage and damage to structure and interior areas.
3. Protect walls, ceilings, floors, and other existing finish work that are to remain or that are exposed during selective demolition operations.
4. Cover and protect furniture, furnishings, and equipment that have not been removed.
5. Comply with requirements for temporary enclosures, dust control, heating, and cooling specified in Section 015000 "Temporary Facilities and Controls."

C. Temporary Shoring: Provide and maintain shoring, bracing, and structural supports as required to preserve stability and prevent movement, settlement, or collapse of construction and finishes to remain, and to prevent unexpected or uncontrolled movement or collapse of construction being demolished.

1. Strengthen or add new supports when required during progress of selective demolition.

3.4 SELECTIVE DEMOLITION, GENERAL

A. General: Demolish and remove existing construction only to the extent required by new construction and as indicated. Use methods required to complete the Work within limitations of governing regulations and as follows:

1. Proceed with selective demolition systematically, from higher to lower level. Complete selective demolition operations above each floor or tier before disturbing supporting members on the next lower level.
2. Neatly cut openings and holes plumb, square, and true to dimensions required. Use cutting methods least likely to damage construction to remain or adjoining construction. Use hand tools or small power tools designed for sawing or grinding, not hammering and chopping, to minimize disturbance of adjacent surfaces. Temporarily cover openings to remain.

3. Cut or drill from the exposed or finished side into concealed surfaces to avoid marring existing finished surfaces.

4. Do not use cutting torches until work area is cleared of flammable materials. At concealed spaces, such as duct and pipe interiors, verify condition and contents of hidden space before starting flame-cutting operations. Maintain[ fire watch and] portable fire-suppression devices during flame-cutting operations.

5. Maintain adequate ventilation when using cutting torches.

6. Remove decayed, vermin-infested, or otherwise dangerous or unsuitable materials and promptly dispose of off-site.

7. Remove structural framing members and lower to ground by method suitable to avoid free fall and to prevent ground impact or dust generation.

8. Locate selective demolition equipment and remove debris and materials so as not to impose excessive loads on supporting walls, floors, or framing.

9. Dispose of demolished items and materials promptly.[ Comply with requirements in Section 017419 "Construction Waste Management and Disposal." ]

B. Reuse of Building Elements: Project has been designed to result in end-of-Project rates for reuse of building elements as follows. Do not demolish building elements beyond what is indicated on Drawings without Architect's approval.

1. Nonshell Elements: 30 percent.

C. Removed and Salvaged Items:

1. Clean salvaged items.
2. Pack or crate items after cleaning. Identify contents of containers.
3. Store items in a secure area until delivery to Owner.
4. Transport items to Owner's storage area on-site.
5. Protect items from damage during transport and storage.

D. Removed and Reinstalled Items:

1. Clean and repair items to functional condition adequate for intended reuse.
2. Pack or crate items after cleaning and repairing. Identify contents of containers.
3. Protect items from damage during transport and storage.
4. Reinstall items in locations indicated. Comply with installation requirements for new materials and equipment. Provide connections, supports, and miscellaneous materials necessary to make item functional for use indicated.

E. Existing Items to Remain: Protect construction indicated to remain against damage and soiling during selective demolition. When permitted by Architect, items may be removed to a suitable, protected storage location during selective demolition[ and cleaned] and reinstalled in their original locations after selective demolition operations are complete.
3.5 SELECTIVE DEMOLITION PROCEDURES FOR SPECIFIC MATERIALS

A. Concrete: Demolish in small sections. Using power-driven saw, cut concrete to a depth of at least 3/4 inch (19 mm) at junctures with construction to remain. Dislodge concrete from reinforcement at perimeter of areas being demolished, cut reinforcement, and then remove remainder of concrete. Neatly trim openings to dimensions indicated.

B. Concrete: Demolish in sections. Cut concrete full depth at junctures with construction to remain and at regular intervals using power-driven saw, then remove concrete between saw cuts.

C. Masonry: Demolish in small sections. Cut masonry at junctures with construction to remain, using power-driven saw, then remove masonry between saw cuts.

D. Concrete Slabs-on-Grade: Saw-cut perimeter of area to be demolished, then break up and remove.

3.6 DISPOSAL OF DEMOLISHED MATERIALS

A. General: Except for items or materials indicated to be recycled, reused, salvaged, reinstalled, or otherwise indicated to remain Owner’s property, remove demolished materials from Project site and legally dispose of them in an EPA-approved landfill. 

1. Do not allow demolished materials to accumulate on-site.
2. Remove and transport debris in a manner that will prevent spillage on adjacent surfaces and areas.
3. Remove debris from elevated portions of building by chute, hoist, or other device that will convey debris to grade level in a controlled descent.
4. Comply with requirements specified in Section 017419 “Construction Waste Management and Disposal.”

B. Burning: Do not burn demolished materials.

C. Disposal: Transport demolished materials and dispose of at designated spoil areas on Owner’s property.

D. Disposal: Transport demolished materials off Owner’s property and legally dispose of them.

3.7 CLEANING

A. Clean adjacent structures and improvements of dust, dirt, and debris caused by selective demolition operations. Return adjacent areas to condition existing before selective demolition operations began.

3.8 SELECTIVE DEMOLITION SCHEDULE

A. Existing Construction to Be Removed: Stucco over Concrete Unit Masonry.
B. Existing Items to Be Removed and Salvaged: No items noted.

C. Existing Items to Be Removed and Reinstalled: Precast concrete cap at the top of the wall.

D. Existing Items to Remain: Refer to architectural drawings.

END OF SECTION 024119
SECTION 03 45 00

PRECAST ARCHITECTURAL CONCRETE

PART 1 - GENERAL

1.1 SUMMARY
A. This Section includes the following:
   1. Architectural precast concrete cladding and load-bearing units.

1.2 DEFINITION

1.3 PERFORMANCE REQUIREMENTS
A. Structural Performance: Provide architectural precast concrete units and connections capable of withstanding the following design loads within limits and under conditions indicated:
   1. Loads: As indicated.

1.4 SUBMITTALS
A. Product Data: For each type of product indicated.
B. LEED Submittal:
   1. Product Data for Credit MR 4.1 and Credit MR 4.2: For products having recycled content, documentation indicating percentages by weight of postconsumer and pre-consumer recycled content.
      a. Include statement indicating costs for each product having recycled content.
C. Design Mixtures: For each precast concrete mixture. Include compressive strength and water-absorption tests.
D. Shop Drawings: Detail fabrication and installation of architectural precast concrete units. Indicate locations, plans, elevations, dimensions, shapes, and cross sections of each unit. Indicate joints, reveals, and extent and location of each surface finish. Indicate details at building corners.
1. Comprehensive engineering analysis certified by the qualified professional engineer responsible for its preparation. Show governing panel types, connections, and types of reinforcement, including special reinforcement. Indicate location, type, magnitude direction of loads imposed on the building structural frame from architectural precast concrete.

E. Samples: For each type of finish indicated on exposed surfaces of architectural precast concrete units, in sets of 3, illustrating full range of finish, color, and texture variations expected; approximately 12 by 12 by 2 inches.

F. Welding certificates.

G. Material test reports: For aggregates.

H. Material Certificates: Signed by manufacturers:

I. Field quality-control test and special inspection reports.

1.5 QUALITY ASSURANCE

A. Fabricator Qualifications: A firm that assumes responsibility for engineering architectural precast concrete units to comply with performance requirements. This responsibility includes preparation of Shop Drawings and comprehensive engineering analysis by a qualified professional engineer.

B. Design Standards: Comply with ACI 318 and design recommendations of PCI MNL 120, "PCI Design Handbook - Precast and Prestressed Concrete," applicable to types of architectural precast concrete units indicated.

C. Quality-Control Standard: For manufacturing procedures and testing requirements, quality-control recommendations, and dimensional tolerances for types of units required, comply with PCI MNL 117, "Manual for Quality Control for Plants and Production of Architectural Precast Concrete Products."


E. Calculated Fire-Test-Response Characteristics: Where indicated, provide architectural precast concrete units whose fire resistance has been calculated as specified and is acceptable to authorities having jurisdiction.

F. Sample Panels: After sample approval and before fabricating architectural precast concrete units, produce as specified sizes in area for review by Architect. Incorporate full-scale details of architectural features, finishes, textures, and transitions in sample panels.

PART 2 - PRODUCTS

2.1 REINFORCING MATERIALS

A. Recycled Content of Steel Products: Provide products with an average recycled content of steel products so postconsumer recycled content plus one-half of pre-
B. Reinforcing Bars: ASTM A 615/A 615M, Grade 60 deformed.

C. Low-Alloy-Steel Reinforcing Bars: ASTM A 706/A 706M, deformed.

D. Plain-Steel Welded Wire Reinforcement: ASTM A 185, fabricated from as-drawn steel wire into flat sheets.


F. Supports: Suspend reinforcement from back of mold or use bolsters, chairs, spacers, and other devices for spacing, supporting, and fastening reinforcing bars and welded wire reinforcement in place according to PCI MNL 117.


2.2 CONCRETE MATERIALS

A. Portland Cement: ASTM C 150, Type I or Type III, gray, unless otherwise indicated.
   1. For surfaces exposed to view in finished structure, mix gray with white cement, of same type, brand, and mill source.

B. Supplementary Cementitious Materials:
   1. Fly Ash: ASTM C 618, Class C or F, with maximum loss on ignition of 3 percent.
   2. Metakaolin Admixture: ASTM C 618, Class N.
   4. Ground Granulated Blast-Furnace Slag: ASTM C 989, Grade 100 or 120.

C. Normal-Weight Aggregates: Except as modified by PCI MNL 117, ASTM C 33, with coarse aggregates complying with Class 5S. Stockpile fine and coarse aggregates for each type of exposed finish from a single source (pit or quarry) for Project.
   1. Face-Mixture-Coarse Aggregates: Selected, hard, and durable; free of material that reacts with cement or causes staining; to match selected finish sample.
      a. Gradation: as specified.
   2. Face-Mixture-Fine Aggregates: Selected, natural or manufactured sand of same material as coarse aggregate, unless otherwise approved by Architect.

D. Coloring Admixture: ASTM C 979, synthetic or natural mineral-oxide pigments or colored water-reducing admixtures, temperature stable, and nonfading.
E. Air-Entraining Admixture: ASTM C 260, certified by manufacturer to be compatible with other required admixtures.

F. Chemical Admixtures: Certified by manufacturer to be compatible with other admixtures and to not contain calcium chloride, or more than 0.15 percent chloride ions or other salts by weight of admixture.

2.3 STEEL CONNECTION MATERIALS

A. Carbon-Steel Shapes and Plates: ASTM A 36/A 36M.

B. Carbon-Steel Headed Studs: ASTM A 108, AISI 1018 through AISI 1020, cold finished, AWS D1.1/D1.1M, Type A or B, with arc shields and with minimum mechanical properties of PCI MNL 117, Table 3.2.3.

C. Carbon-Steel Plate: ASTM A 283/A 283M.

D. Malleable Iron Castings: ASTM A 47/A 47M.


F. High-Strength, Low-Alloy Structural Steel: ASTM A 572/A 572M.

G. Carbon-Steel Structural Tubing: ASTM A 500, Grade B.

H. Wrought Carbon-Steel Bars: ASTM A 675/A 675M, Grade 65.

I. Deformed-Steel Wire or Bar Anchors: ASTM A 496 or ASTM A 706/A 706M.


K. High-Strength Bolts and Nuts: ASTM A 325 Type 1, heavy hex steel structural bolts; heavy hex carbon-steel nuts, ASTM A 563 and hardened carbon-steel washers, ASTM F 436.

L. Zinc-Coated Finish: For exterior steel items, steel in exterior walls, and items indicated for galvanizing, apply zinc coating by hot-dip process according to ASTM A 123/A 123M or ASTM A 153/A 153M electrodeposition according to ASTM B 633, SC 3, Types 1 and 2.

1. Galvanizing Repair Paint: High-zinc-dust-content paint with dry film containing not less than 94 percent zinc dust by weight, and complying with DOD-P-21035A or SSPC- Paint 20.

M. Shop-Primed Finish: Prepare surfaces of nongalvanized steel items, except those surfaces to be embedded in concrete, according to requirements in SSPC-SP 3 and shop-apply as specified according to SSPC-PA 1.

2.4 GROUT MATERIALS
A. Sand-Cement Grout: Portland cement, ASTM C 150, Type I, and clean, natural sand, ASTM C 144 or ASTM C 404. Mix at ratio of 1 part cement to 2-1/2 parts sand, by volume, with minimum water required for placement and hydration.

B. Nonmetallic, Nonshrink Grout: Premixed, nonmetallic, noncorrosive, nonstaining grout containing selected silica sands, portland cement, shrinkage-compensating agents, plasticizing and water-reducing agents, complying with ASTM C 1107, Grade A for drypack and Grades B and C for flowable grout and of consistency suitable for application within a 30-minute working time.

C. Epoxy-Resin Grout: Two-component, mineral-filled epoxy resin; ASTM C 881/C 881M, of type, grade, and class to suit requirements.

2.5 CONCRETE MIXTURES

A. Prepare design mixtures for each type of precast concrete required.

1. Limit use of fly ash and silica fume to 20 percent of portland cement by weight; limit metakaolin and silica fume to 10 percent of portland cement by weight.

B. Design mixtures may be prepared by a qualified independent testing agency or by qualified precast plant personnel at architectural precast concrete fabricator's option.

C. Limit water-soluble chloride ions to maximum percentage by weight of cement permitted by ACI 318 or PCI MNL 117 when tested according to ASTM C 1218/C 1218M.

D. Normal-Weight Concrete Mixtures: Proportion mixtures by either laboratory trial batch or field test data methods according to ACI 211.1, with materials to be used on Project, to provide normal-weight concrete with the following properties:


E. Water Absorption: 6 percent by weight or 14 percent by volume, tested according to PCI MNL 117.

F. Add air-entraining admixture at manufacturer's prescribed rate to result in concrete at point of placement having an air content complying with PCI MNL 117.

G. When included in design mixtures, add other admixtures to concrete mixtures according to manufacturer's written instructions.

2.6 FABRICATION

A. Cast-in Anchors, Inserts, Plates, Angles, and Other Anchorage Hardware: Fabricate anchorage hardware with sufficient anchorage and embedment to comply with design requirements. Accurately position for attachment of loose hardware, and secure in place during precasting operations. Locate anchorage hardware where it does not affect position of main reinforcement or concrete placement.

1. Weld headed studs and deformed bar anchors used for anchorage
according to AWS D1.1/D1.1M and AWS C5.4, "Recommended Practices for Stud Welding."

B. Furnish loose hardware items including steel plates, clip angles, seat angles, anchors, dowels, cramps, hangers, and other hardware shapes for securing architectural precast concrete units to supporting and adjacent construction.

C. Cast-in reglets, slots, holes, and other accessories in architectural precast concrete units as indicated on the Contract Drawings.

D. Reinforcement: Comply with recommendations in PCI MNL 117 for fabricating, placing, and supporting reinforcement.

E. Reinforce architectural precast concrete units to resist handling, transportation, and erection stresses.

F. Prestress tendons for architectural precast concrete units by either pretensioning or post-tensioning methods. Comply with PCI MNL 117.

G. Comply with requirements in PCI MNL 117 and requirements in this Section for measuring, mixing, transporting, and placing concrete. After concrete batching, no additional water may be added.

H. Place face mixture to a minimum thickness after consolidation of the greater of 1 inch or 1.5 times the maximum aggregate size, but not less than the minimum reinforcing cover specified.

I. Place concrete in a continuous operation to prevent seams or planes of weakness from forming in precast concrete units.

   1. Place backup concrete mixture to ensure bond with face-mixture concrete.

J. Thoroughly consolidate placed concrete by internal and external vibration without dislocating or damaging reinforcement and built-in items, and minimize pour lines, honeycombing, or entrapped air on surfaces. Use equipment and procedures complying with PCI MNL 117.

   1. Place self-consolidating concrete without vibration according to PCI TR-6, "Interim Guidelines for the Use of Self-Consolidating Concrete in Precast/Prestressed Concrete Institute Member Plants."

K. Comply with PCI MNL 117 for hot- and cold-weather concrete placement.

L. Identify pickup points of architectural precast concrete units and orientation in structure with permanent markings, complying with markings indicated on Shop Drawings. Imprint or permanently mark casting date on each architectural precast concrete unit on a surface that will not show in finished structure.

M. Cure concrete, according to requirements in PCI MNL 117, by moisture retention without heat or by accelerated heat curing using low-pressure live steam or radiant heat and moisture. Cure units until compressive strength is high enough to ensure that stripping does not have an effect on performance or appearance of final product.

N. Discard and replace architectural precast concrete units that do not comply with
requirements, including structural, manufacturing tolerance, and appearance, unless repairs meet requirements in PCI MNL 117 and Architect's approval.

2.7 FABRICATION TOLERANCES

A. Fabricate architectural precast concrete units straight and true to size and shape with exposed edges and corners precise and true so each finished panel complies with PCI MNL 117 product tolerances as well as position tolerances for cast-in items.

2.8 FINISHES

A. Panel faces shall be free of joint marks, grain, and other obvious defects. Corners, including false joints shall be uniform, straight, and sharp. Finish exposed-face surfaces of architectural precast concrete units to match approved as specified and as follows:

1. As specified.
2. PCI's "Architectural Precast Concrete - Color and Texture Selection Guide," of plate numbers indicated.
3. As-Cast Surface Finish: Provide surfaces free of pockets, sand streaks, and honeycombs.
4. Textured-Surface Finish: Impart by form liners or inserts to provide surfaces free of pockets, streaks, and honeycombs, with uniform color and texture.
5. Bushhammer Finish: Use power or hand tools to remove matrix and fracture coarse aggregates.
7. Abrasive-Blast Finish: Use abrasive grit, equipment, application techniques, and cleaning procedures to expose aggregate and surrounding matrix surfaces.
8. Acid-Etched Finish: Use acid and hot-water solution, equipment, application techniques, and cleaning procedures to expose aggregate and surrounding matrix surfaces. Protect hardware, connections, and insulation from acid attack.
9. Honed Finish: Use continuous mechanical abrasion with fine grit, followed by filling and rubbing procedures.
10. Polished Finish: Use continuous mechanical abrasion with fine grit, followed by filling and rubbing procedures.
11. Sand-Embedment Finish: Use selected stones placed in a sand bed in bottom of mold, with sand removed after curing.

B. Finish exposed top bottom and back surfaces of architectural precast concrete units to match face-surface finish.

C. Finish unexposed surfaces of architectural precast concrete units by float finish.

2.9 SOURCE QUALITY CONTROL

A. Quality-Control Testing: Test and inspect precast concrete according to PCI MNL 117 requirements. If using self-consolidating concrete, also test and inspect according to PCI TR-6, "Interim Guidelines for the Use of Self-Consolidating Concrete in Precast/Prestressed Concrete Institute Member Plants."
B. Owner will employ an independent testing agency to evaluate architectural precast concrete fabricator's quality-control and testing methods.

PART 3 - EXECUTION

3.1 INSTALLATION

A. Install clips, hangers, bearing pads, and other accessories required for connecting architectural precast concrete units to supporting members and backup materials.

B. Erect architectural precast concrete level, plumb, and square within specified allowable tolerances. Provide temporary supports and bracing as required to maintain position, stability, and alignment as units are being permanently connected.
   1. Maintain horizontal and vertical joint alignment and uniform joint width as erection progresses.
   2. Unless otherwise indicated, provide for uniform joint widths of 3/4 inch.

C. Connect architectural precast concrete units in position by bolting, welding, grouting, or as otherwise indicated on Shop Drawings. Remove temporary shims, wedges, and spacers as soon as practical after connecting and grouting are completed.

D. Welding: Comply with applicable AWS D1.1/D1.1M and AWS D1.4 for welding, welding electrodes, appearance, quality of welds, and methods used in correcting welding work.

E. At bolted connections, use lock washers, tack welding, or other approved means to prevent loosening of nuts after final adjustment.

F. Grouting Connections: Grout connections where required or indicated. Retain grout in place until hard enough to support itself. Pack spaces with stiff grout material, tamping until voids are completely filled. Place grout to finish smooth, level, and plumb with adjacent concrete surfaces. Keep grouted joints damp for not less than 24 hours after initial set. Promptly remove grout material from exposed surfaces before it affects finishes or hardens.

G. Erect architectural precast concrete units level, plumb, square, true, and in alignment without exceeding the noncumulative erection tolerances of PCI MNL 117, Appendix I.

3.2 FIELD QUALITY CONTROL

A. Special Inspections: Engage a qualified special inspector to perform all special inspections and prepare reports.

B. Testing Agency: Engage a qualified testing agency to perform tests and inspections and prepare test reports.

C. Field welds will be subject to visual inspections and nondestructive testing according to ASTM E 165 or ASTM E 709. High-strength bolted connections will be subject to inspections.

D. Testing agency will report test results promptly and in writing to Contractor and Architect.
E. Repair or remove and replace work where tests and inspections indicate that it does not comply with specified requirements.

F. Additional testing and inspecting, at Contractor's expense, will be performed to determine compliance of replaced or additional work with specified requirements.

3.3 REPAIRS

A. Repair damaged architectural precast concrete units if permitted by Architect. The Architect reserves the right to reject repaired units that do not comply with requirements.

B. Mix patching materials and repair units so cured patches blend with color, texture, and uniformity of adjacent exposed surfaces and show no apparent line of demarcation between original and repaired work, when viewed in typical daylight illumination from a distance of 20 feet.

C. Prepare and repair damaged galvanized coatings with galvanizing repair paint according to ASTM A 780.

D. Wire brush, clean, and paint damaged prime-painted components with same type of shop primer.

E. Remove and replace damaged architectural precast concrete units when repairs do not comply with requirements.

3.4 CLEANING

A. Clean surfaces of precast concrete units exposed to view.

B. Clean mortar, plaster, fireproofing, weld slag, and other deleterious material from concrete surfaces and adjacent materials immediately.

C. Clean exposed surfaces of precast concrete units after erection and completion of joint treatment to remove weld marks, other markings, dirt, and stains.
   1. Perform cleaning procedures, if necessary, according to precast concrete fabricator's recommendations. Clean soiled precast concrete surfaces with detergent and water, using stiff fiber brushes and sponges, and rinse with clean water. Protect other work from staining or damage due to cleaning operations.
   2. Do not use cleaning materials or processes that could change the appearance of exposed concrete finishes or damage adjacent materials.

END OF SECTION 034500
SECTION 04 20 20

CONCRETE UNIT MASONRY

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes: Single Wythe concrete unit masonry and supplementary items necessary for installation.

1.2 DEFINITIONS

A. Load-Bearing Masonry: Masonry containing reinforcing steel in grouted cells for load-bearing assemblies designed by Structural Engineer to support axial (gravity) loads and lateral (wind/seismic) loads.

B. Masonry Terminology: Refer to NCMA TEK 1-4 and other referenced quality standards.

1.3 SUBMITTALS

A. Product Data: Manufacturer's technical literature for each type of product and system indicated.

1. Include manufacturer’s specifications for materials, finishes, construction details, installation instructions, and recommendations for maintenance.

B. Shop Drawings: Show details of construction, including dimensioned drawings, plans, elevations, sections, and details of components to be incorporated into Work including, but not limited to, the following:

1. Concrete Masonry Units: Show sizes, profiles, and coursing.
2. Special Masonry Shapes: Submit large-scale details for each shape required or indicated.
3. Flashing: Large-scale details for each element of flashing system showing layout, profiles, methods of joining, and anchorage details; including lintel units, shelf units, corner units, end dam units, conditions showing interface and relationship to adjacent materials, and other special applications.
4. Reinforcing Steel: Detail bending and placement of unit masonry reinforcing bars. Comply with ACI 315. Show elevations of reinforced masonry assemblies.
5. Fabricated Flashing: Detail corner units, end-dam units, and other special applications.
6. Anchors, Ties, and Accessories: Show sizes, coursing, and locations.
7. Control Joints: Show sizes and locations.

C. Samples for Verification Purposes: Submit samples for each item listed below of size and construction indicated. 16
1. Accessories: Samples of manufactured products, including anchors, ties, cavity drainage material, flashing materials, weeps, vents, and other accessories.

2. Flashing: Samples of each shape, profile, intersection and transition required, not less than 12 in (300 mm) long, including end dam, and splice/lap joint for lintel/shelf angle flashing; demonstrate soldering quality.

D. Product Test Reports: Written reports based on evaluation of comprehensive tests performed by qualified testing agency indicating that each product complies with requirements.

1. Concrete Masonry Units: Material test reports substantiating compliance with specified requirements.
2. Cementitious Materials: Each product required for mortar, including name of manufacturer, brand, type, and weight slips at time of delivery.
3. Mortar Mixes: Certification of mortar mix design shall be based on evaluation of comprehensive tests performed. Include description of type and proportions of ingredients.
4. Grout Mixes: Certification of grout mix design shall be based on evaluation of comprehensive tests performed. Include description of type and proportions of ingredients.
5. Reinforcing bars.
7. Anchors, Ties, and Accessories: Each type and size of manufactured products.

E. Hot Weather Work Plan: Submit written plan detailing methods, materials and equipment to be used to comply with weather requirements.

F. Field Quality Control Reports: Written report of testing and inspection required by “Field Quality Control”.

G. Manufacturer’s Project Acceptance Document: Certification by the manufacturer that its product(s) are approved, acceptable, suitable for use in specific locations, for specific details, and for applications indicated, specified, or required. Provide for each type and size of following:

H. Qualification Data: For manufacturer and installer.

1. For firms and persons specified in "Quality Assurance" to demonstrate their capabilities and experience. Include lists of completed projects with project names and addresses, names and addresses of Architects and Owners, and other information specified.
2. Architect may waive submittal of qualification data for available manufacturers listed in this Section.

1.4 QUALITY ASSURANCE

A. Manufacturer Qualifications: Manufacturer with not less than 10 years experience with successful production of products and systems similar to the scope of this Project, with a record of successful in-service performance and completion of projects for a period of not less than 10 years and with sufficient production capability, facilities, and personnel to produce required Work.
B. Installer Qualifications:

1. Experience: Installer with not less than 10 years experience in performing specified Work similar to scope of this Project, with a record of successful in-service performance and completion of projects for a period of not less than 10 years, and with sufficient production capability, facilities, and personnel to produce required Work.

2. Supervision: Installer shall maintain a competent supervisor who is at Project during times specified Work is in progress that is experienced in installing systems similar to type and scope required for Project.

C. Manufacturer’s Technical Representative Qualifications: Direct employee of technical services department of manufacturer with minimum of 5 years experience in providing recommendations, observations, evaluations, and problem diagnostics. Sales representatives are not acceptable.

D. Testing Agency Qualifications: An independent testing agency, acceptable to authorities having jurisdiction, qualified according to ASTM C 1093 to conduct the testing indicated.

1.5 DELIVERY, STORAGE, AND HANDLING

A. Delivery: Label pallets of masonry units with manufacturers name, product name, and information required to identify products.

B. Storage:

1. Masonry Units: Store on elevated platforms in a dry location. If units are not stored in an enclosed location, cover tops and sides of stacks with waterproof sheeting, securely tied. If units become wet, do not install until they are dry.

2. Cementitious Materials: Store on elevated platforms, under cover, and in a dry location. Do not use cementitious materials that have become damp.

3. Aggregates: Store where grading and other required characteristics can be maintained and contamination avoided.

4. Accessories: Store to prevent corrosion and accumulation of dirt and oil.

1.6 PROJECT CONDITIONS

A. Protection during Work: Prevent excess moisture from entering Work in progress.

1. Cover tops of walls, projections, and sills with water-repellent tarps or heavy plastic sheets at end of each day’s Work.

2. Cover partially completed masonry when construction is not in progress.

3. Extend cover minimum of 24 in (600 mm) down both sides and hold cover securely in place.

4. Protect door and window frames from damage.

B. Warm Weather Requirements: Comply with building code or TMS 602/ACI 530.1/ASCE 6 whichever is more stringent, and the following:
1. Protect Work against uneven and excessive evaporation and from strong flows of dry air, both natural and artificial.
2. Apply and cure work as required by climatic and job conditions to prevent dryout during cure period.
3. Provide suitable coverings, moist curing, barriers to deflect sunlight and wind, or combinations of these, as required.

1.7 COORDINATION

A. Coordinate installation of products and systems with interfacing and adjoining construction to provide a successful installation without failure.

PART 2 - PRODUCTS

2.1 MANUFACTURERS AND PRODUCTS

A. Available Manufacturers and Products: Subject to compliance with requirements of Contract Documents as judged by the Architect, manufacturers offering products that may be incorporated into the Work include, but are not limited to, those listed.

B. Basis of Design (Product Standard): Contract Documents are based on products and systems specified to establish a standard of quality. Other available manufacturers offering products having equivalent characteristics may be considered, provided deviations are minor and comply with requirements of Contract Documents as judged by the Architect.

2.2 MATERIALS, GENERAL

A. Single Source Responsibility: Furnish each type of product from single manufacturer. Provide secondary materials only as recommended by manufacturer of primary materials.

B. Masonry Units: Obtain exposed masonry units of a uniform texture and color, or a uniform blend within ranges accepted for these characteristics.

C. Cementitious Materials: Obtain cementitious ingredients of a uniform quality, including color, for each component.

2.3 MASONRY UNITS, GENERAL

A. Defective Units: Referenced masonry unit standards may allow a certain percentage of units to exceed tolerances and to contain chips, cracks, or other defects exceeding limits stated in the standard. Do not use units where such defects, including dimensions that vary from specified dimensions by more than stated tolerances, will be exposed in the completed Work or will impair the quality of completed masonry.

B. Special Shapes: Provide shapes indicated and as follows for each form of masonry unit required:

1. Provide special shapes for lintels, corners, jambs, sashes, movement joints, headers, bonding, and other special conditions.
2. At interior locations, provide bullnosed units for outside exposed corners, unless otherwise indicated.
3. At exterior locations, provide square-edged units for outside exposed corners, unless otherwise indicated.

2.4 PERFORMANCE REQUIREMENTS

A. Load Bearing Masonry:
   1. Provide reinforced masonry that develops net-area compressive strengths \( f'_{m} \) at 28 days as indicated on Structural Drawings.
   2. Determine net-area compressive strength \( f'_{m} \) of masonry from average net-area compressive strengths of masonry units and mortar types (unit-strength method).

B. Fire-Resistance Ratings: Where indicated, provide materials and construction identical to those of assemblies with fire-resistance ratings determined according to ASTM E 119/NFPA 251/ UL 623 by a testing and inspecting agency, by equivalent concrete masonry thickness, or by other means, as acceptable to authorities having jurisdiction.

2.5 CONCRETE MASONRY UNITS (CMU)


2.6 MORTAR AND GROUT MATERIALS

A. Portland Cement:
   1. Material Quality Standard: ASTM C 150, Type I; except Type III may be used for cold-weather construction.
   2. Color: Natural gray color or white cement as required to produce mortar color required.
   3. Manufacturers:
      a. Lafarge North America.
      b. Lehigh Cement Co.
      c. Lone Star Industries, Inc.
      d. Rinker Materials.
      e. Royal White Cement.

B. Hydrated Lime:
   1. Material Quality Standard: ASTM C 207, Type S.
   2. Manufacturers:
      a. Graymont Dolime (OH) Inc.
      b. Rockwell Lime Co.

C. Portland Cement-Lime Mix: Packaged blend of Portland cement and hydrated lime containing no other ingredients.
1. Types of Cements Not permitted:

D. Aggregate for Standard Gray Mortar:
   2. Mortar Exposed to View: Use washed aggregate consisting of natural sand or crushed stone.
   3. Joints Less Than 1/4 in (6 mm) Thick: Use aggregate graded with 100 percent passing the No. 16 (1.18 mm) sieve.

E. Aggregate for Grout: ASTM C 404.

F. Water-Repellent Admixture:
   1. Description: Liquid water-repellent mortar admixture intended for use with concrete masonry units, containing integral water repellent by same manufacturer.
   2. Manufacturers and Products:
      a. Addiment Inc.; Mortar Tite.
      b. Grace Construction Products; Dry-Block Mortar Admixture.
      c. Master Builders, Inc.; Color Cure Mortar Admix or Rheomix Rheopel.

G. Water: Potable, clean and free of amounts of oils, acids, alkalies, salts, organic materials, or other substances that are deleterious to mortar or any metal within the wall.

H. Compressive Strength of Mortar: 3,000 psi minimum at 28-days.

2.7 JOINT REINFORCEMENT

A. Masonry Joint Reinforcement, General:
   1. Product Quality Standard: ASTM A 951 / A 951M.
   2. Interior Walls: Mill galvanized, carbon steel, ASTM A 641 / A 641M.
   4. Wire Size for Side Rods: 0.187 in (4.76 mm) diameter or as indicated.
   5. Wire Size for Cross Rods: 0.148 in (3.77mm) diameter or as indicated.
   6. Spacing of Cross Rods, Tabs, and Cross Ties: Not more than 16 in (400 mm) on centers.
   7. Lengths: Not less than 10 ft (3 m), with prefabricated corner and tee units.

B. Masonry Joint Reinforcement for Single-Wythe Masonry: Either ladder or truss type with single pair of side rods.

C. Manufacturers:
   1. Dur-O-Wal, Inc.
   2. Heckmann Building Products, Inc.
3. Hohmann & Barnard, Inc.
4. Wire-Bond.

2.8 REINFORCEMENT

A. Uncoated Steel Reinforcing Bars Product Quality Standard: ASTM A 615 / A 615M or ASTM A 996 / A 996M, Grade 60 (Grade 420). Sizes as indicated on the Drawings.

2.9 ANCHORS AND TIES

A. Materials:
   1. Interior Walls:
      b. Galvanized Steel Sheet, ASTM A 653 / A 653M, Commercial Steel, G60 (Z180) zinc coating.
   2. Exterior Walls:
      b. Steel Sheet, Galvanized after Fabrication: ASTM A 1008 / A 1008M, Commercial Steel, hot-dip galvanized after fabrication to comply with ASTM A 153 / A 153M.

B. Sizes and Thicknesses: If not indicated below, as shown on Drawings, required by building code, or required by TMS 602/ACI 530.1/ASCE 6.

2.10 MISCELLANEOUS MASONRY ACCESSORIES

A. Compressible Filler:
   2. Description: Pre-molded filler strips formulated from neoprene; compressible up to 35 percent; of width and thickness indicated.

B. Pre-formed Control Joint Gaskets:
   2. Description: Formed from styrene-butadiene-rubber compound designed to fit standard sash block to maintain lateral stability in masonry wall.

C. Bond Breaker Strips:
   1. Product Quality Standard: ASTM D 226, Type I.
   2. Description: Asphalt-saturated, organic roofing felt (No. 15 asphalt felt).

D. Reinforcing Bar Positioners:
1. Description: Wire units designed to fit into mortar bed joints spanning masonry unit cells with loops for holding reinforcing bars in center of cells. Units are formed from 0.142 in (3.6 mm) steel wire, hot-dip galvanized after fabrication. Provide units with either two loops or four loops as needed for number of bars indicated.

2. Manufacturers and Products:
   a. Dayton Superior Corp.; Dur-O-Wal Division; DA 810, DA 812 or DA 817.
   c. Hohmann & Barnard, Inc.; #RB or #RB-Twin Rebar Positioner.
   d. Wire-Bond; O-Ring or Double O-Ring Rebar Positioner.

E. Cavity Wall Insulation: As specified in Division 07 Section “Thermal Insulation”.

2.11 MORTAR AND GROUT MIXES

A. General: Mix cementitious materials in a mechanical batch mixer with a sufficient amount of water to produce a workable consistency for minimum 3 minutes to 5 minutes; do not hand mix.

1. Admixture Limitation: Do not use admixtures, including pigments, air-entraining agents, accelerators, retarders, water-repellent agents, antifreeze compounds, calcium chloride, or other admixtures, unless otherwise indicated.

2. Cementitious Limitation: Limit cementitious materials in mortar and grout to Portland cement and lime.

3. Ingredient Measurement: Measure in a one cubic foot batching box before mixing for component materials not pre-blended, prepackaged or containerized.

4. Aggregate Moisture Content: Monitor moisture content of aggregates and exercise caution when mixing to avoid over or under-sanding of the mortar.

B. Pre-blended, Dry Mortar Mix: Furnish dry mortar ingredients in form of a pre-blended mix. Measure quantities by weight to ensure accurate proportions, and thoroughly blend ingredients before delivering to Project.

C. Mortar Mix:

1. Mix Quality Standard: ASTM C 270, Proportion Specification for portland cement-lime mortars, Types as follows for applications stated unless another type is indicated:

   a. Reinforced Masonry: Type S.
   b. Other Applications: Type S where another type is not indicated.


D. Grout for Unit Masonry:


2. Use grout of type indicated or, if not otherwise indicated, of type (fine or coarse) that will comply with Table 1.15.1 in TMS 602/ACI 530.1/ASCE 6 for dimensions of grout spaces and pour height.
3. Use fine grout in grout spaces less than 2 in (50 mm) in horizontal dimension.
4. Use coarse grout in grout spaces 2 in (50 mm) or more in least horizontal dimension.
5. Provide grout with a slump of 8 to 11 in (200 to 275 mm) as measured according to ASTM C 143 / C 143M.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Acceptance of Surfaces and Conditions: Examine substrates to receive products and systems and associated work for compliance with requirements and other conditions affecting performance. Proceed only when unsatisfactory conditions have been corrected in a manner complying with Contract Documents. Starting work within a particular area will be construed as acceptance of surface conditions.

3.2 INSTALLATION, GENERAL

A. Installation Quality Standards: In addition to standards listed elsewhere, perform Work according to following, unless otherwise specified:
   1. TMS 602/ACI 530.1/ASCE 6, unless local building code has jurisdiction.
   2. Applicable portions of NCMA TEK’s.
   3. Respective manufacturer’s written installation instructions.
   4. Accepted submittals.
   6. PCA - Concrete Masonry Handbook, if no other installation quality standard applies to condition.

3.3 PREPARATION

A. General: Comply with manufacturer’s instructions, recommendations, and specifications for cleaning and surface preparation. Surfaces shall have no defects, contaminants, or errors which would result in poor or potentially defective installation or would cause latent defects in Work.

3.4 INSTALLATION OF CONCRETE UNIT MASONRY

A. Thickness: Build single-wythe masonry walls to actual widths of masonry units, using units of widths indicated.

B. Chases and Recesses: Build to accommodate items specified in this and other Sections.

C. Openings: Leave for equipment to be installed before completing masonry. After installing equipment, complete masonry to match the construction immediately adjacent to opening.

D. Cutting: Use full-size units without cutting if possible. If cutting is required to provide a continuous pattern or to fit adjoining construction, cut units with motor-driven saws; provide clean, sharp, unchipped edges. Install cut units with cut surfaces and, where possible, cut edges concealed.
E. Blending of Masonry Units: Select and arrange units for exposed unit masonry to produce a uniform blend of colors and textures. Mix units from several pallets or cubes as they are placed. If color blending is a critical aspect of Work, manufacturer shall provide instructions for blending.

F. Mortar Workability: Mortar with added color pigments shall not be retempered. Discard mortar that has begun to stiffen or is not used within 2.5 hours after initial mixing.

3.5 LINTELS

A. Precast Concrete Lintels: Set where indicated, with not less than 8 in (200 mm) of bearing at each jamb, unless otherwise indicated.

B. Masonry Lintels: Construct in place using formwork and shoring of sufficient strength to support Work, until strength has been achieved and assembly is cured.

3.6 LAYING MASONRY WALLS

A. General: Lay out walls in advance for accurate spacing of surface bond patterns, uniform joint thicknesses, accurate location of openings, movement-type joints, returns, and offsets. Avoid using less than half-size units at corners, jambs, and, where possible at other locations.

B. Stopping and Resuming Work: In each course, rack back appropriate unit length for bond pattern; do not tooth. When resuming Work, clean masonry surfaces that are to receive mortar, remove loose masonry units and mortar.

C. Built-in Work:

1. As construction progresses, build in items specified in this and other Sections. Fill in solidly with masonry around built-in items.

2. Fill space between steel frames and masonry solidly with mortar, unless otherwise indicated.

3. Where built-in items are to be embedded in cores of hollow masonry units, place a layer of metal lath, wire mesh, or plastic mesh in the joint below and rod mortar or grout into core.

D. Concrete Masonry Cores under Loads: Fill cores in hollow concrete masonry units with grout 24 in (600 mm) under bearing plates, beams, lintels, posts, and similar items, unless otherwise indicated.

E. Top of Fire-Rated Partitions: Treat joint between top of partition and underside of structure above to comply with Division 07 Section "Fire-Resistive Joint Systems". 
3.7 MORTAR BEDDING AND JOINTING

A. General Procedures:

1. Do not disturb previously laid units.
2. Spread mortar for bed joint only so far ahead of laying units that mortar will be plastic when units are laid.
3. Butter end of unit with ample mortar so that head joint is completely filled with mortar when placed.
4. Do not deeply furrow bed joints or slush head joints.
5. Avoid over-plumbing and pounding of corners and jambs to fit stretcher unit after setting in place. Where adjustments must be made after initial setting, remove mortar and replace with fresh mortar.
6. Rock closures into place with both head joints and closure space spread with ample mortar. Place against adjacent units so that both horizontal and vertical joints are completely filled.

B. Mortar Joint Thickness: Minimum 3/8 in (10 mm) wide for head and bed joints.

C. Hollow Concrete Masonry Units: Lay as follows:

1. With face shells fully bedded in mortar and with head joints of depth equal to bed joints.
2. With webs fully bedded in mortar in all courses of piers, columns, and pilasters.
3. With webs fully bedded in mortar in grouted masonry, including starting course on footings.
4. With entire units, including areas under cells, fully bedded in mortar at starting course on footings where cells are not grouted.

D. Solid Concrete Masonry Units: Lay with completely filled bed and head joints; butter ends with sufficient mortar to fill head joints and shove into place. Do not deeply furrow bed joints or slush head joints.

E. Joint Tooling: Tool exposed joints slightly concave when thumbprint hard, using a jointer larger than joint thickness, unless otherwise indicated.

1. Make mortar joints straight, clean, and uniform in thickness. Tool joints to produce dense surface well bonded to edges.
2. Joints which are not tight at time of tooling shall be raked out, pointed, and then tooled.
3. Tool when mortar is partially set but still sufficiently plastic to bond.
4. Use a tool which compacts mortar, pressing excess mortar out of joint rather than dragging it out.
5. Tool vertical joint first.

F. Joints at Direct Applied Finishes: Cut joints flush for masonry walls to receive Portland cement plaster or other direct-applied finishes (other than paint), unless otherwise indicated.
3.8 MASONRY JOINT REINFORCEMENT

A. General: Install entire length of longitudinal side rods in mortar with a minimum cover of 5/8 in (15 mm) on exterior side of walls, 1/2 in (12 mm) elsewhere. Lap reinforcement a minimum of 6 in (150 mm).

1. Space reinforcement not more than 16 in (400 mm) on centers.
2. Space reinforcement not more than 8 in (200 mm) on centers in parapet walls.
3. Provide reinforcement not more than 8 in (200 mm) above and below wall openings and extending 12 in (300 mm) beyond openings.

B. Installation Conditions:

1. Interrupt joint reinforcement at control and expansion joints, unless otherwise indicated.
2. Provide continuity at wall intersections by using prefabricated T-shaped units.
3. Provide continuity at corners by using prefabricated L-shaped units.
4. Cut and bend reinforcing units as directed by manufacturer for continuity at returns, offsets, column fireproofing, pipe enclosures, and other special conditions.

3.9 CONTROL JOINTS

A. General: Install control joint materials as masonry progresses. Do not allow materials to span control joints without provision to allow for in-plane wall or partition movement. Maintain joints free and clear of mortar.

B. Control Joints: Form in concrete masonry using one of following methods:

1. Install preformed control-joint gaskets designed to fit standard sash block.
2. Install temporary foam-plastic filler in head joints and remove filler when unit masonry is complete for application of sealant.
3. At structural bond beams, provide dummy groove or raked joint. Do not extend control joints through bond beams.

C. Control Joint Spacing: Locate control joints as indicated on the Drawings not to exceed 30 ft (9 m) on center. Keep control joints straight, true, and continuous from top to bottom of masonry. Form open control joint of width indicated for installation of sealant and backer rod specified in Division 07 Section “Joint Sealants”.

D. Horizontal Joints: Build in horizontal pressure-relieving joints as indicated; construct of width required for installation of sealant and backer rod specified in Division 07 Section “Joint Sealants”.

3.10 LINTELS

A. Concrete or Masonry Lintels: Provide lintels where shown and where openings of more than 24 in (600 mm) for block-size units are shown without structural steel or other supporting lintels.
1. Provide precast concrete lintels made from concrete matching concrete masonry units in color, texture, and compressive strength and with reinforcing bars required to support loads indicated.

2. Provide prefabricated or built-in-place masonry lintels. Use specially formed bond beam units with reinforcing bars placed and filled with coarse grout. Cure precast lintels before handling and installing.

B. Minimum Bearing: Provide 8 in (200 mm) at each jamb, unless otherwise indicated.

3.11 LOAD-BEARING MASONRY

A. Temporary Formwork and Shores: Construct formwork and shores as needed to support reinforced masonry elements during construction.

1. Construct formwork to provide shape, line, and dimensions of completed masonry as indicated. Make forms sufficiently tight to prevent leakage of mortar and grout. Brace, tie, and support forms to maintain position and shape during construction and curing of reinforced masonry.

2. Do not remove forms and shores until reinforced masonry members have hardened sufficiently to carry their own weight and other temporary loads that may be placed on them during construction.

B. Placing Reinforcement: Comply with requirements in TMS 602/ACI 530.1/ASCE 6.

1. Provide minimum bar lap splice not less than 48 bar diameters unless otherwise indicated.

2. Provide corner bars of same size and spacing as horizontal bars unless otherwise indicated.

C. Grouting: Do not place grout until entire height of masonry to be grouted has attained enough strength to resist grout pressure.

1. Comply with requirements in TMS 602/ACI 530.1/ASCE 6 for cleanouts and for grout placement, including minimum grout space and maximum pour height unless otherwise required by local applicable code.

2. Place grout only after inspectors have verified compliance of grout spaces and grades, sizes, and locations of reinforcement.

3. Limit height of vertical grout pours to not more than 60 in (1500 mm).

4. Fill with grout, vertical cells, bond beams, lintels and other structural members having reinforcement. Secure in place and inspect reinforcing before grouting. Keep mortar droppings out of grout space and puddle or vibrate grout in place.

5. Provide solid bearing under structural members at least 8 in (200 mm) vertically and at least 16 in (400 mm) horizontally. Bearing may be solid units, or hollow units with grout. Fill cells in units adjacent to openings.

6. Grout from inside face of masonry and prevent grout from staining masonry face. Protect projecting surfaces from droppings and clean immediately any grout which comes in contact with face of masonry.

3.12 TOLERANCES

A. Conspicuous Lines:
1. Vertical: For such conditions as external corners, door and window jambs, reveals, and expansion joints, maximum variation of one of following from plumb:
   a. 1/8 in (3 mm) per 10 ft (3 m).
   b. 1/4 in (6 mm) per 20 ft (6 m).
   c. 1/2 in (12 mm) overall.

2. Horizontal: For such conditions as exposed lintels, sills, door and window heads, parapets, and reveals, maximum variation of one of following from level:
   a. 1/8 in (3 mm) per 10 ft (3 m).
   b. 1/4 in (6 mm) per 20 ft (6 m).
   c. 1/2 in (12 mm) overall.

B. Exposed Head Joints:
   1. Vertical Alignment: Maximum variation of one of following from plumb:
      a. 1/4 in (6 mm) per 10 ft (3 m).
      b. 1/2 in (12 mm) from plumb top to bottom of wall.
   2. Thickness: Maximum variation from width indicated of plus or minus 1/8 in (3 mm); maximum variation from adjacent bed joint and head joint thicknesses 1/8 in (3 mm).

C. Exposed Bed Joints: Maximum variation from width indicated of plus or minus 1/8 in (3 mm), with a maximum thickness limited to 1/2 in (12 mm); maximum variation from bed joint thickness of adjacent courses of 1/8 in (3 mm).

D. Flush Alignment: Maximum variation of 1/16 in (1.5 mm) except due to warpage of masonry units with tolerances specified for warpage of units.

3.13 FIELD QUALITY CONTROL

A. Owner’s Testing Agency Field Service: The Owner may employ and pay a qualified independent testing agency to perform field quality control. Materials and installation failing to meet specified requirements shall be replaced at Contractor's expense. Retesting of materials and installations failing to meet specified requirements shall be done at Contractor’s expense.

1. Mortar Tests: Verify mortar composition with specified requirements according to ASTM C 780, Annex A4; made at following times during Work:
   1) First day.
   2) 5 percent.
   3) 15 percent.
   4) 30 percent.
   5) 60 percent.
2. Grout Test: Test each mix provided, according to ASTM C 1019 for compressive strength.
3. Testing Frequency: One set of tests for each 5000 sf (465 sm) of wall area or portion thereof unless otherwise indicated.
4. Inspections: Testing agency will visit project site periodically at random, but not less than once during each week of masonry Work, to inspect progress and to ascertain if Work complies with Contract Documents. Allow inspectors access to scaffolding and Work areas, as needed to perform inspections. Inspections will include verification that:
   a. Materials are properly stored.
   b. Installation is within specified construction tolerances.
   c. Proper mortar ingredients and mixing techniques are being used.
   d. Mortar time on board is within specified limits.
   e. Bed and head joints are being properly made.
   f. Anchorages are as specified.
   g. Joints are being properly tooled.
   h. Flashing assembly is being properly fabricated and installed.
   i. Weeps and vents are being installed and are functional.
   j. Control joints are being installed as indicated, or, as specified.
   k. Reinforcement and embedded items are being installed as indicated.
5. Evaluation of Quality Control Tests: Replace Work in areas where test results fail to comply with requirements indicated.

3.14 ADJUSTING

A. Damaged Units: Remove and replace masonry units that are loose, chipped, broken, stained, or otherwise damaged or that do not match adjoining units. Install new units to match adjoining units; install in fresh mortar, pointed to eliminate evidence of replacement.

B. Pointing: During tooling of joints, enlarge voids and holes, except weeps and vents, and completely fill with mortar. Point up joints, including corners, openings, and adjacent construction, to provide a neat, uniform appearance. Prepare joints for sealant application, where indicated.

3.15 PROTECTION

A. Protection of Work: When installed at building interiors, provide protection of lower 96 in (2400 mm) portion of decorative-faced concrete masonry in form of rigid panels to prevent damage and to resist staining.

B. Cleaning: During cleaning operations, protect surrounding areas, landscaping, adjacent surfaces, and vehicles from contact with cleaning products.
   1. Clean surfaces prior to installation of windows and doors.
   2. Avoid drifting of spray caused by wind.
3.16 CLEANING

A. In-Progress Cleaning: Clean unit masonry as Work progresses by dry brushing to remove mortar fins and smears before tooling joints.

B. Protection: Prior to Final Cleaning, protect surrounding areas, landscaping, adjacent surfaces, and vehicles from contact with cleaning products.

C. Final Cleaning: After mortar is thoroughly set and cured, clean exposed masonry as follows:

1. Remove large mortar particles by hand with wooden paddles and nonmetallic scrape hoes or chisels.
2. Test cleaning methods on sample wall panel; leave one-half of panel uncleaned for comparison purposes. Obtain Architect's acceptance of sample cleaning before proceeding with cleaning of masonry.
3. Protect adjacent stone and non-masonry surfaces from contact with cleaner by covering them with liquid strippable masking agent or polyethylene film and waterproof masking tape.
4. Wet wall surfaces with water before applying cleaners; remove cleaners promptly by rinsing surfaces thoroughly with clear water.
5. Clean concrete masonry by cleaning method indicated in NCMA TEK 8-2A applicable to type of stain on exposed surfaces.

END OF SECTION 042200
SECTION 05 72 00
STAINLESS STEEL CABLE RAILINGS

PART 1 GENERAL

1.1 SECTION INCLUDES
A. Stainless Steel Cable Railings: Pre-engineered, component-based, horizontal cable infill, stainless steel handrail, posts, and components ornamental railing system.

1.2 RELATED SECTIONS
A. Section 03 30 00 - Cast-in-Place Concrete.
B. Section 06 20 00 - Finish Carpentry.
C. Section ______ - ____________: Execution requirements for placement of anchors specified in this section in ________ wall construction.

1.3 REFERENCES
C. ASTM A 276 - Stainless Steel Bars and Shapes.
D. ASTM A 312 - Seamless and Welded Austenitic Stainless Steel Pipes.
E. ASTM A 314 - Stainless Steel Billets and Bars for Forging.
G. ASTM A 554 - Welded Stainless Steel Mechanical Tubing.
H. ASTM A 582 - Free-Machining Stainless and Heat-Resisting Steel Bars.
I. ANSI A 1264.1 - Safety Requirements for Workplace Floor and Wall Openings, Stairs, and Railing Systems.
K. 29 CFR 1910.23 - Guarding floor and wall openings; Occupational Safety and Health Administration.
M. ICBO Uniform Building Code; International Conference of Building Officials.
1.4 DESIGN / PERFORMANCE REQUIREMENTS

A. Structural Performance: Provide handrails and railings systems, including top rail, bottom rail, end posts, intermediate posts, cables, and cable hardware capable of withstanding the following structural loads without exceeding allowable design working stress of materials for handrails, railings, anchors and connections in conformance with applicable codes:

1. Top Rail of Guards: Shall withstand the following loads:
   a. Concentrated load of 200 lbf (0.89kN) applied at any point and in any direction.
   b. Uniform load of 50 lbf-ft (0.07kN-m) applied horizontally and concurrently with uniform load of 100 lbf-ft (0.14kN-m) applied vertically downward.
   c. Concentrated and uniform loads above need not be assumed to act concurrently.

2. Guard Infill Area: Shall withstand the following loads:
   a. Concentrated horizontal load of 200 lbf (0.89 kN) applied to 1 sq ft at any point in system, including panels, intermediate rails, balusters, or other elements composing infill area. Loads need not be assumed to act concurrently with loads on top rails in determining stress on guard.

B. Corrosion Resistance: Separate incompatible materials to prevent galvanic corrosion.

1.5 SUBMITTALS

A. 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 instructions and methods.
   4. Description of materials, components, fabrication, and finishes.
   5. Structural test reports provided by the manufacturer evidencing compliance with the specifications.

B. Shop Drawings: Submit manufacturer's shop drawings, including plans, elevations, sections, and details, indicating materials, components, sizes, dimensions, tolerances, hardware, finishes, options, accessories, and installation. Show details of attaching railing system to supports.

C. Verification Samples: For each finish product specified, two samples, adequate in size, representing actual product, workmanship, and finishes.
   1. Railing frame components.
   2. Cables.
   3. Cable hardware.

D. Manufacturer's Certificates: Certify products meet or exceed specified requirements.

E. Maintenance Instructions: Submit manufacturer's maintenance and cleaning instructions.

1.6 QUALITY ASSURANCE

A. Manufacturer Qualifications: Company specializing in manufacturing products specified in this section with minimum five years documented experience.

B. Installer Qualifications: Manufacturer's trained installers or an installer acceptable to the manufacturer

1.7 DELIVERY, STORAGE, AND HANDLING

A. Deliver and store materials to site in manufacturer's original, unopened containers and packaging, with labels clearly identifying product name and manufacturer.
B. Store products in clean, dry area indoors until ready for installation. Store materials in accordance with manufacturer's instructions.

C. Protect materials and finish from damage during handling and installation.

1.8 SEQUENCING

A. Ensure that locating templates and other information required for installation of products of this section are furnished to affected trades in time to prevent interruption of construction progress.

B. Ensure that products of this section are supplied to affected trades in time to prevent interruption of construction progress.

1.9 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. Verify actual openings by field measurements before fabrication; show recorded measurements on shop drawings.

C. Coordinate field measurements and fabrication schedule with construction progress to avoid construction delays.

1.10 PRE-INSTALLATION MEETING

A. Convene a pre-installation meeting approximately two weeks before start of fabrication of railing frame components and construction of railing frame component mounting surfaces. Require attendance of parties directly affecting work of this section, including Contractor, Architect and Installer. Review the following:
   1. Specific method of installation of components into mounting surfaces.
   2. Installation, adjusting, cleaning, and protection of railing system.
   3. Coordination with other work.

1.11 COORDINATION

A. Coordinate Work with other operations and installation of adjacent materials to avoid damage.

PART 2 PRODUCTS

2.1 MANUFACTURERS

A. Basis of Design: SunRail Nautilus 1 by Atlantis Rail, located at: 70 Armstrong Rd.; Plymouth, MA 02360; Toll Free Tel: 800-541-6829; Tel: 508-732-9191; Fax: 508-732-9798; Email: info@atlantisrail.com; Web: www.atlantisrail.com

B. Substitutions: Approved equals.

C. Requests for substitutions will be considered in accordance with provisions of Section 01 60 00 - Product Requirements.

2.2 MATERIALS

A. Stainless Steel Structural Tubing: ASTM A 554, Type 316, minimum tensile strength 70,000 psi; 2 inch (50 mm) diameter.
B. Wire Rope: ASTM A 492, Type 316 stainless steel wire; 5/32 inch (4 mm) diameter, 1x19 configuration, conforming to dimensional properties specified in MIL-W-87161.

C. Wood Railing Frame Components: As specified in Section 06 20 00 - Finish Carpentry.

D. Tempered Glass: ASTM C1048, Kind FT (fully tempered), Condition A (uncoated), Type 1 (transparent flat glass), Quality-Q3; Class 1 (clear); tested for surface and edge compression according to ASTM C 1048 and for impact strength according to 16 CFR 1201 for Category II materials.

E. Electrical Components: Micro Star LED Lighting; LEDs encased in Type 316 stainless steel housings; 1/4 inch (6 mm) diameter by 7/8 inch (22 mm) long installed in railings.

2.3 ORNAMENTAL RAILING SYSTEM

A. Stainless Steel Cable Railing System: Pre-engineered, component-based, horizontal cable infill, stainless steel handrail, posts, and components ornamental railing system.
   1. Guardrail Post: Stainless steel structural tubing, 2 inch (50 mm) diameter, Type 316 stainless steel, 5 foot (1524 mm) O.C. maximum.
      a. Height: 42 inch (1067 mm).
   2. Stair Rail Post: Stainless Steel Round Tube, 2 inch (50 mm) diameter, Type 316 stainless steel, 36 inch (914 mm) rail height, 4 foot (1219 mm) O.C. maximum.
   3. Stainless Steel Finish:
      a. Selection by Architect. Provide choices in the shop drawing submittal
   4. Wire Rope: ASTM A 492, Type 316 stainless steel wire; 5/32 inch (4 mm) diameter, 1x19 configuration, conforming to dimensional properties specified in MIL-W-87161.
      a. Orientation: Horizontal.
      b. Spacing: 3 inches (76 mm) O.C.
      c. Finish: Passivated.
   5. Tensioner Assemblies: Stainless steel tensioners with mechanical swaging capability. Slotted base has capability of making up to 45 degree angles. Radius base fits two 2 inch (50 mm) diameter posts.
      a. Radius base.

2.4 FABRICATION:

A. Fabricate systems in accord with approved shop drawings and the manufacturer's instructions.

B. Preassemble items in shop to greatest extent practicable to minimize assembly at project site. Disassemble units only to extent necessary for shipping and handling limitations. Mark units for reassembly.

C. Field connections may be done using manufacturer's recommended methods.

PART 3 EXECUTION

3.1 EXAMINATION

A. Do not begin installation until substrates have been properly prepared.

B. Verify field measurements are acceptable to suit stair assembly tolerances.

C. Verify supports and anchors are correctly positioned.

D. If substrate preparation is the responsibility of another installer, notify Architect of
unsatisfactory preparation before proceeding.

3.2 PREPARATION

A. Take field measurements after permanent end terminations are in place and prior to preparation of shop drawings and fabrication, to ensure fitting of work.

B. Prepare surfaces using the methods recommended by the manufacturer for achieving the best result for the substrate under the project conditions.

C. Coordinate installation of railing system components with related work under sections 03300, 06200 and 08800.

3.3 INSTALLATION

A. Install railing system in accordance with manufacturer's instructions.

B. Install railing system plumb, level, square, true to line, and rigid.

C. Ensure that wire ropes are parallel to each other, free of kinks, sags or other defects, and clean.

D. Attach railing system securely in place using fasteners supplied or approved by manufacturer. Embedded anchor plates and supporting steel shall be provided by another trade and coordinated with the railing supplier.

E. Attach railing system to supports approved by manufacturer.

F. Connect components with one part epoxy adhesive as approved by manufacturer.

G. Use manufacturer's supplied hardware.

H. Repair minor damages to finish in accordance with manufacturer's instructions and as approved by Architect.

I. Remove and replace defective or damaged components that cannot be successfully repaired as determined by Architect.

3.4 CLEANING

A. Remove temporary coverings and protection of adjacent work areas.

B. Clean railing system promptly after installation in accordance with manufacturer's instructions.

C. Do not use harsh cleaning materials or methods that would damage glass or finish.

D. Do not use abrasive cleaners.

3.5 PROTECTION

A. Protect installed products until completion of project.

B. Replace defective or damaged components as directed by Architect.

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

END OF SECTION
SECTION 05 73 00 - DECORATIVE METAL RAILINGS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Section Includes:
   1. Aluminum decorative railings.

B. Related Sections:
   1. Section 06 10 00 Rough Carpentry for wood blocking for anchoring railings.

1.3 DEFINITIONS

A. Railings: Guards, handrails, and similar devices used for protection of occupants at open-sided floor areas, pedestrian guidance and support, visual separation, or wall protection.

1.4 PERFORMANCE REQUIREMENTS

A. Delegated Design: Design railings, including comprehensive engineering analysis by a qualified professional engineer, using performance requirements and design criteria indicated.

B. General: In engineering railings to withstand structural loads indicated, determine allowable design working stresses of railing materials based on the following:

   1. Aluminum: The lesser of minimum yield strength divided by 1.65 or minimum ultimate tensile strength divided by 1.95.

C. Structural Performance: Railings shall withstand the effects of gravity loads and the following loads and stresses within limits and under conditions indicated:

   1. Handrails and Top Rails of Guards:
      a. Uniform load of 50 lbf/ft. (0.73 kN/m) applied in any direction.
      b. Concentrated load of 200 lbf (0.89 kN) applied in any direction.
      c. Uniform and concentrated loads need not be assumed to act concurrently.
2. Infill of Guards:
   a. Concentrated load of 50 lbf (0.22 kN) applied horizontally on an area of 1 sq. ft. (0.093 sq. m).
   b. Infill load and other loads need not be assumed to act concurrently.

D. Thermal Movements: Allow for thermal movements from ambient and surface temperature changes acting on exterior metal fabrications by preventing buckling, opening of joints, overstressing of components, failure of connections, and other detrimental effects.

   1. Temperature Change: 120 deg F (67 deg C), ambient; 180 deg F (100 deg C), material surfaces.

E. Control of Corrosion: Prevent galvanic action and other forms of corrosion by insulating metals and other materials from direct contact with incompatible materials.

1.5 PRECONSTRUCTION TESTING

A. Preconstruction Testing Service: Engage a qualified testing agency to perform preconstruction testing on laboratory mockups. Payment for these services will be made by Contractor. Retesting of products that fail to meet specified requirements shall be done at Contractor's expense.

   1. Test railings according to ASTM E 894 and ASTM E 935.
   2. Notify Architect seven days in advance of the dates and times when laboratory mockups will be tested.

1.6 ACTION SUBMITTALS

A. Product Data: For the following:

   1. Manufacturer's product lines of railings assembled from standard components.
   2. Grout, anchoring cement, and paint products.

B. Shop Drawings: Include plans, elevations, sections, details, and attachments to other work.

   1. For illuminated railings, include wiring diagrams and roughing-in details.

C. Samples for Initial Selection: For products involving selection of color, texture, or design, including mechanical finishes.

D. Samples for Verification: For each type of exposed finish required.

   1. Sections of each distinctly different linear railing member, including handrails, top rails, posts, and balusters.
   2. Assembled Samples of railing systems, made from full-size components, including top rail, post, handrail, and infill. Show method of finishing members at intersections. Samples need not be full height.
E. Delegated-Design Submittal: For installed products indicated to comply with performance requirements and design criteria, including analysis data signed and sealed by the qualified professional engineer responsible for their preparation.

1.7 INFORMATIONAL SUBMITTALS

A. Qualification Data: For qualified professional engineer.

B. Mill Certificates: Signed by manufacturers of stainless-steel products certifying that products furnished comply with requirements.

C. Welding certificates.

D. Product Test Reports: Based on evaluation of comprehensive tests performed by a qualified testing agency, according to ASTM E 894 and ASTM E 935.

E. Preconstruction test reports.

1.8 QUALITY ASSURANCE

A. Source Limitations: Obtain each type of railing from single source from single manufacturer.

B. Product Options: Information on Drawings and in Specifications establishes requirements for system's aesthetic effects and performance characteristics. Aesthetic effects are indicated by dimensions, arrangements, alignment, and profiles of components and assemblies as they relate to sightlines, to one another, and to adjoining construction. Performance characteristics are indicated by criteria subject to verification by one or more methods including structural analysis, preconstruction testing, field testing, and in-service performance.

1. Do not modify intended aesthetic effects, as judged solely by Architect, except with Architect's approval. If modifications are proposed, submit comprehensive explanatory data to Architect for review.

C. Product Options: Drawings indicate size, profiles, and dimensional requirements of railings and are based on the specific system indicated. Refer to Section 016000 "Product Requirements."

1. Do not modify intended aesthetic effects, as judged solely by Architect, except with Architect's approval. If modifications are proposed, submit comprehensive explanatory data to Architect for review.

D. Welding Qualifications: Qualify procedures and personnel according to the following:

1. AWS D1.1/D1.1M, "Structural Welding Code - Steel."
2. AWS D1.2/D1.2M, "Structural Welding Code - Aluminum."
3. AWS D1.6, "Structural Welding Code - Stainless Steel."
E. Mockups: Build mockups to verify selections made under sample submittals and to demonstrate aesthetic effects and set quality standards for fabrication and installation.

1. Build mockups as shown on Drawings.
2. Build mockups for each form and finish of railing consisting of two posts, top rail, infill area, and anchorage system components that are full height and are not less than 24 inches (600 mm) in length.
3. Approved mockups may become part of the completed Work if undisturbed at time of Substantial Completion.

F. Preinstallation Conference: Conduct conference at Project site.

1.9 PROJECT CONDITIONS

A. Field Measurements: Verify actual locations of walls and other construction contiguous with railings by field measurements before fabrication and indicate measurements on Shop Drawings.

1.10 COORDINATION AND SCHEDULING

A. Coordinate selection of shop primers with topcoats to be applied over them. Comply with paint and coating manufacturers’ written recommendations to ensure that shop primers and topcoats are compatible with one another.

B. Coordinate installation of anchorages for railings. Furnish setting drawings, templates, and directions for installing anchorages, including sleeves, concrete inserts, anchor bolts, and items with integral anchors, that are to be embedded in concrete or masonry. Deliver such items to Project site in time for installation.

C. Schedule installation so wall attachments are made only to completed walls. Do not support railings temporarily by any means that do not suit structural performance requirements.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:

1. Aluminum Decorative Railings:
   a. ATR Technologies, Inc.
   b. Blum, Julius & Co., Inc.
   c. Blumcraft of Pittsburgh.
   d. Braun, J. G., Company; a division of the Wagner Companies.
   e. Livers Bronze Co.
   f. Railings Plus Inc.
2.2 METALS, GENERAL

A. Metal Surfaces, General: Provide materials with smooth surfaces, without seam marks, roller marks, rolled trade names, stains, discolorations, or blemishes.

B. Brackets, Flanges, and Anchors: Same metal and finish as supported rails unless otherwise indicated.

1. Provide cast-metal brackets with flange tapped for concealed anchorage to threaded hanger bolt.
2. Provide either formed- or cast-metal brackets with predrilled hole for exposed bolt anchorage.
3. Provide formed-steel brackets with predrilled hole for bolted anchorage and with snap-on cover that matches rail finish and conceals bracket base and bolt head.
4. Provide extruded-aluminum brackets with interlocking pieces that conceal anchorage. Locate set screws on bottom of bracket.

2.3 ALUMINUM

A. Aluminum, General: Provide alloy and temper recommended by aluminum producer and finisher for type of use and finish indicated, and with strength and durability properties for each aluminum form required not less than that of alloy and temper designated below.

B. Extruded Bars and Shapes, Including Extruded Tubing: ASTM B 221, Alloy 6063-T5/T52.


1. Provide Standard Weight (Schedule 40) pipe unless otherwise indicated.

D. Drawn Seamless Tubing: ASTM B 210 (ASTM B 210M), Alloy 6063-T832. Alloy 5005 provides a smooth, high-quality finish and is a preferred choice for anodizing. Alloy 6061 is preferred if high strength is important, but it is not suitable for bending and does not anodize as well as Alloy 5005. Yield strength for Alloy 6061-T6 is 32 to 35 ksi (220 to 240 MPa). Note that Alloy 6063 is not available in plate and sheet form.


2.4 FASTENERS

A. Fastener Materials: Unless otherwise indicated, provide the following:

1. Aluminum Components: Type 316 stainless-steel fasteners.

B. Fasteners for Anchoring to Other Construction: Select fasteners of type, grade, and class required to produce connections suitable for anchoring railings to other types of construction indicated and capable of withstanding design loads.

C. Provide concealed fasteners for interconnecting railing components and for attaching railings to other work.

D. Anchors, General: Anchors capable of sustaining, without failure, a load equal to six times the load imposed when installed in unit masonry and four times the load imposed when installed in concrete, as determined by testing according to ASTM E 488, conducted by a qualified independent testing agency.

E. Post-Installed Anchors: Torque-controlled expansion anchors.

1. Material for Interior Locations: Carbon-steel components zinc plated to comply with ASTM B 633 or ASTM F 1941 (ASTM F 1941M), Class Fe/Zn 5, unless otherwise indicated.


2.5 MISCELLANEOUS MATERIALS

A. Welding Rods and Bare Electrodes: Select according to AWS specifications for metal alloy welded.

1. For aluminum railings, provide type and alloy as recommended by producer of metal to be welded and as required for color match, strength, and compatibility in fabricated items.

B. Brazing Rods: For copper-alloy railings, provide type and alloy as recommended by producer of metal to be brazed and as required for color match, strength, and compatibility in fabricated items.

C. Low-Emitting Paints and Coatings: Paints and coatings applied to interior decorative metal railings shall comply with the testing and product requirements of the California Department of Health Services' "Standard Practice for the Testing of Volatile Organic Emissions from Various Sources Using Small-Scale Environmental Chambers."

D. Galvanizing Repair Paint: High-zinc-dust-content paint complying with SSPC-Paint 20 and compatible with paints specified to be used over it.

E. Shop Primers: Provide primers that comply with [Section 099113 "Exterior Painting" and Section 099123 "Interior Painting." ] [Section 099600 "High-Performance
Coatings."] [Section 099113 "Exterior Painting," Section 099123 "Interior Painting," and Section 099600 "High-Performance Coatings."]

F. Universal Shop Primer: Fast-curing, lead- and chromate-free, universal modified-alkyd primer complying with MPI#79 and compatible with topcoat.

1. Use primer containing pigments that make it easily distinguishable from zinc-rich primer.

G. Epoxy Zinc-Rich Primer: Complying with MPI#20 and compatible with topcoat.

H. Shop Primer for Galvanized Steel: [Cementitious galvanized metal primer complying with MPI#26] [Vinyl wash primer complying with MPI#80] [Water-based galvanized metal primer complying with MPI#134].

I. Intermediate Coats and Topcoats: Provide products that comply with [Section 099113 "Exterior Painting" and Section 099123 "Interior Painting."] [Section 099600 "High-Performance Coatings."] [Section 099113 "Exterior Painting," Section 099123 "Interior Painting," and Section 099600 "High-Performance Coatings."]

J. Epoxy Intermediate Coat: Complying with MPI#77 and compatible with primer and topcoat.

K. Polyurethane Topcoat: Complying with MPI#72 and compatible with undercoat.

L. Bituminous Paint: Cold-applied asphalt emulsion complying with ASTM D 1187.

M. Nonshrink, Nonmetallic Grout: Factory-packaged, nonstaining, noncorrosive, nongaseous grout complying with ASTM C 1107. Provide grout specifically recommended by manufacturer for interior and exterior applications.

N. Anchoring Cement: Factory-packaged, nonshrink, nonstaining, hydraulic-controlled expansion cement formulation for mixing with water at Project site to create pourable anchoring, patching, and grouting compound.

1. Water-Resistant Product: [At exterior locations] [and] [where indicated] provide formulation that is resistant to erosion from water exposure without needing protection by a sealer or waterproof coating and that is recommended by manufacturer for exterior use.

2.6 FABRICATION

A. General: Fabricate railings to comply with requirements indicated for design, dimensions, member sizes and spacing, details, finish, and anchorage, but not less than that required to support structural loads.

B. Assemble railings in the shop to greatest extent possible to minimize field splicing and assembly. Disassemble units only as necessary for shipping and handling limitations.
Clearly mark units for reassembly and coordinated installation. Use connections that maintain structural value of joined pieces.

C. Make up wire-rope assemblies in the shop to field-measured dimensions with fittings machine swaged. Minimize amount of turnbuckle take-up used for dimensional adjustment so maximum amount is available for tensioning wire ropes. Tag wire-rope assemblies and fittings to identify installation locations and orientations for coordinated installation.

D. Cut, drill, and punch metals cleanly and accurately. Remove burrs and ease edges to a radius of approximately 1/32 inch (1 mm) unless otherwise indicated. Remove sharp or rough areas on exposed surfaces.

E. Form work true to line and level with accurate angles and surfaces.

F. Fabricate connections that will be exposed to weather in a manner to exclude water. Provide weep holes where water may accumulate. Locate weep holes in inconspicuous locations.

G. Cut, reinforce, drill, and tap as indicated to receive finish hardware, screws, and similar items.

H. Connections: Fabricate railings with [welded] [or] [nonwelded] connections unless otherwise indicated.

I. Welded Connections: Cope components at connections to provide close fit, or use fittings designed for this purpose. Weld all around at connections, including at fittings.
   1. Use materials and methods that minimize distortion and develop strength and corrosion resistance of base metals.
   2. Obtain fusion without undercut or overlap.
   3. Remove flux immediately.
   4. At exposed connections, finish exposed welds to comply with NOMMA's "Voluntary Joint Finish Standards" for Type 1 welds: no evidence of a welded joint.

J. Welded Connections for Aluminum Pipe: Fabricate railings to interconnect members with concealed internal welds that eliminate surface grinding, using manufacturer's standard system of sleeve and socket fittings.

K. Brazed Connections: Connect copper-alloy railings by brazing. Cope components at connections to provide close fit, or use fittings designed for this purpose. Braze corners and seams continuously.
   1. Use materials and methods that match color of base metal, minimize distortion, and develop maximum strength and corrosion resistance.
   2. Remove flux immediately.
   3. At exposed connections, finish exposed surfaces smooth and blended so no roughness shows after finishing and brazed surface matches contours of adjoining surfaces.
L. Mechanical Connections: Connect members with concealed mechanical fasteners and fittings. Fabricate members and fittings to produce flush, smooth, rigid, hairline joints.
   1. Fabricate splice joints for field connection using an epoxy structural adhesive if this is manufacturer's standard splicing method.

M. Form changes in direction as follows:
   1. As detailed.
   2. By bending to smallest radius that will not result in distortion of railing member.

N. Bend members in jigs to produce uniform curvature for each configuration required; maintain cross section of member throughout entire bend without buckling, twisting, cracking, or otherwise deforming exposed surfaces of components.

O. Close exposed ends of hollow railing members with prefabricated end fittings.

P. Provide wall returns at ends of wall-mounted handrails unless otherwise indicated. Close ends of returns, unless clearance between end of rail and wall is 1/4 inch (6 mm) or less.

Q. Brackets, Flanges, Fittings, and Anchors: Provide wall brackets, flanges, miscellaneous fittings, and anchors to interconnect railing members to other work unless otherwise indicated.
   1. At brackets and fittings fastened to plaster or gypsum board partitions, provide crush-resistant fillers, or other means to transfer loads through wall finishes to structural supports and prevent bracket or fitting rotation and crushing of substrate.

R. Provide inserts and other anchorage devices for connecting railings to concrete or masonry work. Fabricate anchorage devices capable of withstanding loads imposed by railings. Coordinate anchorage devices with supporting structure.

S. For railing posts set in concrete, provide [steel] [stainless-steel] sleeves not less than 6 inches (150 mm) long with inside dimensions not less than 1/2 inch (13 mm) greater than outside dimensions of post, with metal plate forming bottom closure.

T. For removable railing posts, fabricate slip-fit sockets from [steel] [stainless-steel] tube or pipe whose ID is sized for a close fit with posts; limit movement of post without lateral load, measured at top, to not more than one-fortieth of post height. Provide socket covers designed and fabricated to resist being dislodged.
   1. Provide chain with eye, snap hook, and staple across gaps formed by removable railing sections at locations indicated. Fabricate from same metal as railings.

2.7 PANEL FABRICATION

A. General: Fabricate to sizes and shapes required; provide for proper edge clearance and bite on glazing panels.
1. Clean-cut or flat-grind edges at butt-glazed sealant joints to produce square edges with slight chamfers at junctions of edges and faces.
2. Grind smooth exposed edges, including those at open joints, to produce square edges with slight chamfers at junctions of edges and faces.

2.8 GENERAL FINISH REQUIREMENTS

A. Comply with NAAMM's "Metal Finishes Manual for Architectural and Metal Products" for recommendations for applying and designating finishes.

B. Protect mechanical finishes on exposed surfaces from damage by applying a strippable, temporary protective covering before shipment.

C. Appearance of Finished Work: Noticeable variations in same piece are not acceptable. Variations in appearance of abutting or adjacent pieces are acceptable if they are within one-half of the range of approved Samples. Variations in appearance of other components are acceptable if they are within the range of approved Samples and are assembled or installed to minimize contrast.

D. Provide exposed fasteners with finish matching appearance, including color and texture, of railings.

2.9 ALUMINUM FINISHES

A. Finish designations prefixed by AA comply with the system established by the Aluminum Association for designating aluminum finishes.

B. High-Performance Organic Finish: Two-coat fluoropolymer finish complying with AAMA 2605 and containing not less than 70 percent PVDF resin by weight in color coat. Prepare, pretreat, and apply coating to exposed metal surfaces to comply with coating and resin manufacturers' written instructions.

1. Color and Gloss: Match existing wave railings color and gloss.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine plaster and gypsum board assemblies, where reinforced to receive anchors, to verify that locations of concealed reinforcements have been clearly marked for Installer. Locate reinforcements and mark locations if not already done.
3.2 INSTALLATION, GENERAL

A. Fit exposed connections together to form tight, hairline joints.

B. Perform cutting, drilling, and fitting required for installing railings. Set railings accurately in location, alignment, and elevation; measured from established lines and levels and free of rack.

1. Do not weld, cut, or abrade surfaces of railing components that have been coated or finished after fabrication and that are intended for field connection by mechanical or other means without further cutting or fitting.

2. Set posts plumb within a tolerance of 1/16 inch in 3 feet (2 mm in 1 m).

3. Align rails so variations from level for horizontal members and variations from parallel with rake of steps and ramps for sloping members do not exceed 1/4 inch in 12 feet (5 mm in 3 m).

C. Corrosion Protection: Coat concealed surfaces of [aluminum] [and] [copper alloys] that will be in contact with grout, concrete, masonry, wood, or dissimilar metals, with a heavy coat of bituminous paint.

D. Adjust railings before anchoring to ensure matching alignment at abutting joints.

E. Fastening to In-Place Construction: Use anchorage devices and fasteners where necessary for securing railings and for properly transferring loads to in-place construction.

3.3 RAILING CONNECTIONS

A. Nonwelded Connections: Use mechanical or adhesive joints for permanently connecting railing components. Use wood blocks and padding to prevent damage to railing members and fittings. Seal recessed holes of exposed locking screws using plastic cement filler colored to match finish of railings.

B. Welded Connections: Use fully welded joints for permanently connecting railing components. Comply with requirements for welded connections in "Fabrication" Article whether welding is performed in the shop or in the field.

C. Expansion Joints: Install expansion joints at locations indicated but not farther apart than required to accommodate thermal movement. Provide slip-joint internal sleeve extending 2 inches (50 mm) beyond joint on either side, fasten internal sleeve securely to one side, and locate joint within 6 inches (150 mm) of post.

3.4 ANCHORING POSTS

A. Use steel pipe sleeves preset and anchored into concrete for installing posts. After posts have been inserted into sleeves, fill annular space between post and sleeve with [nonshrink, nonmetallic grout] [or] [anchoring cement], mixed and placed to comply with anchoring material manufacturer's written instructions.
B. Form or core-drill holes not less than 5 inches (125 mm) deep and 3/4 inch (20 mm) larger than OD of post for installing posts in concrete. Clean holes of loose material, insert posts, and fill annular space between post and concrete with [nonshrink, nonmetallic grout] [or] [anchoring cement], mixed and placed to comply with anchoring material manufacturer's written instructions.

C. Cover anchorage joint with flange of same metal as post, [welded to post after placing anchoring material] [attached to post with set screws].

D. Leave anchorage joint exposed with [1/8-inch (3-mm) buildup, sloped away from post] [anchoring material flush with adjacent surface].

E. Anchor posts to metal surfaces with flanges, angle type, or floor type as required by conditions, connected to posts and to metal supporting members as follows:
   1. For aluminum railings, attach posts as indicated using fittings designed and engineered for this purpose.
   2. For copper-alloy railings, attach posts as indicated using fittings designed and engineered for this purpose.
   3. For stainless-steel railings, weld flanges to posts and bolt to metal-supporting surfaces.
   4. For steel railings, weld flanges to posts and bolt to metal-supporting surfaces.

F. Install removable railing sections, where indicated, in slip-fit metal sockets cast in concrete.

3.5 ATTACHING RAILINGS

A. Anchor railing ends to concrete and masonry with [sleeves concealed within] [flanges connected to] [brackets on underside of rails connected to] railing ends and anchored to wall construction with anchors and bolts.

B. Anchor railing ends to metal surfaces with flanges bolted to metal surfaces and [welded to railing ends] [or] [connected to railing ends using nonwelded connections].

C. Attach handrails to walls with wall brackets except where end flanges are used. Provide brackets with 1-1/2-inch (38-mm) clearance from inside face of handrail and finished wall surface. Locate brackets as indicated or, if not indicated, at spacing required to support structural loads.
   1. Use type of bracket with flange tapped for concealed anchorage to threaded hanger bolt.
   2. Locate brackets as indicated or, if not indicated, at spacing required to support structural loads.

D. Secure wall brackets and railing end flanges to building construction as follows:
   1. For concrete and solid masonry anchorage, use drilled-in expansion shields and hanger or lag bolts.
2. For hollow masonry anchorage, use toggle bolts.

3.6 FIELD QUALITY CONTROL

A. Testing Agency: The Contractor will engage a qualified testing and inspecting agency to perform field tests and inspections and prepare test reports. Payment for these services will be made by the Contractor.

B. Extent and Testing Methodology: Testing agency will randomly select completed railing assemblies for testing that are representative of different railing designs and conditions in the completed Work. Railings will be tested according to ASTM E 894 and ASTM E 935 for compliance with performance requirements.

C. Remove and replace railings where test results indicate that they do not comply with specified requirements unless they can be repaired in a manner satisfactory to Architect and will 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.

3.7 CLEANING

A. Clean aluminum and stainless steel by washing thoroughly with clean water and soap, rinsing with clean water, and wiping dry.

B. Touchup Painting: Immediately after erection, clean field welds, bolted connections, and abraded areas of shop paint, and paint exposed areas with the same material as used for shop painting to comply with SSPC-PA 1 for touching up shop-painted surfaces.

1. Apply by brush or spray to provide a minimum 2.0-mil (0.05-mm) dry film thickness.

C. Touchup Painting: Cleaning and touchup painting of field welds, bolted connections, and abraded areas of shop paint are specified in [Section 099113 "Exterior Painting" and Section 099123 "Interior Painting." ] [Section 099600 "High-Performance Coatings." ] [Section 099113 "Exterior Painting," Section 099123 "Interior Painting," and Section 099600 "High-Performance Coatings." ]

D. Galvanized Surfaces: Clean field welds, bolted connections, and abraded areas and repair galvanizing to comply with ASTM A 780.

3.8 PROTECTION

A. Protect finishes of railings from damage during construction period with temporary protective coverings approved by railing manufacturer. Remove protective coverings at time of Substantial Completion.
B. Restore finishes damaged during installation and construction period so no evidence remains of correction work. Return items that cannot be refinished in the field to the shop; make required alterations and refinish entire unit, or provide new units.

END OF SECTION 057300
PART 1 GENERAL

1.1 SECTION INCLUDES:

A. Grounds, nailers, blocking, miscellaneous framing, plywood backing panels, plywood sheathing, preservative treatment, and necessary accessories indicated or specified in this section.

1.2 RELATED SECTIONS

A. Section 01572-Construction and Waste Management.
B. Section 06300-Wood Treatment.
C. Section 07210-Building Insulation.
D. Section 10100-Visual Display Boards and Cases.
E. Section 10165-Plastic Toilet Partitions.

1.3 REFERENCES

A. ASLS-American Softwood Lumber Standards.
   1. D6007 Determination of Formaldehyde Concentration in Air from Wood Products.
   3. E1333-Standard Test Method for Determining Formaldehyde Concentrations in Air and Emission Rates from Wood Products Using a Large Chamber
D. FSC STD-01-001, "FSC Principles and Criteria for Forest Stewardship."
F. SPIB-Southern Pine Inspection Bureau.

1.4 SUBMITTALS

A. Certification of Compliance: Include data for wood-preservative and fire-retardant treatment from chemical treatment manufacturer and certification by treating plant that treated materials comply with requirements.
B. Product Data

1. Low Emitting Materials.
   (a) Submit manufacturer’s Material Safety Data Sheet Indicating VOC limits of all products.
   (b) Submit manufacturer’s certification that all products comply with Standard Practice for The Testing of Volatile Organic Emissions from Various Sources Using Small-Scale Environmental Chambers, including 2004 Addenda. California Department of Health Services.

2. Recycled Content:
   (a) Indicate recycled content; indicate percentage of pre-consumer and post-consumer recycled content per unit of product.

3. Regional Materials:
   (a) Sourcing location(s): Indicate location of extraction, harvesting, and recovery; indicate distance between extraction, harvesting, and recovery and the project site.
   (b) Manufacturing location(s): Indicate location of manufacturing facility; indicate distance between manufacturing facility and the project site.

4. Sustainable Forestry:
   (a) Forest Stewardship Council (FSC): Provide of Chain-of-custody certificates signed by the lumber supplier validating compliance with FSC STD-01-001, "FSC Principles and Criteria for Forest Stewardship."
   (b) Submit copies of invoices indicating cost data and the FSC certification numbers for each product.
   (c) Include evidence that mill is certified for chain of custody by an FSC-accredited certification body.

1.5 QUALITY ASSURANCE

A. Factory mark each piece of lumber and plywood to identify type, grade, agency providing inspection service, producing mill and other qualities as specified.

B. Forest Certification: Provide interior architectural woodwork produced from wood obtained from forests certified by an FSC-accredited certification body to comply with FSC STD-01-001, "FSC Principles and Criteria for Forest Stewardship."

C. Engineered Wood Products:

1. Determine formaldehyde concentrations in air from wood products under test conditions of temperature and relative humidity in accordance with ASTM D6007 or E1333.
2. Determine Volatile Organic Compounds VOC), excluding formaldehyde, emitted from manufactured wood-based panels in accordance with ASTM D6330.

1.6 DELIVERY AND STORAGE

A. Keep materials dry during delivery and storage.

1. Protect against weather and contact with damp or wet surfaces.
2. Stack lumber and plywood and provide air circulation.
1.7 SITE CONDITIONS

A. Powder driven fasteners are not allowed.

PART 2 PRODUCTS

2.1 MATERIALS

A. All engineered wood products to contain recycled wood materials.

B. All wood products shall comply with FSC STD-01-001, "FSC Principles and Criteria for Forest Stewardship".

C. All plywood products shall comply with Standard Practice for The Testing Of Volatile Organic Emissions from Various Sources Using Small-Scale Environmental Chambers, including 2004 Addenda. California Department of Health Services.

D. Exterior Plywood:
   2. Grade: APA rated sheathing, EXT, span rating to suit rafter spacing.
   3. Thickness: Indicated on Drawings.

E. Interior Plywood (Concealed): Where plywood will be concealed by other Work, provide exterior type plywood C-D plugged grade, unless otherwise specified.

F. Interior Plywood (Painted Finish): Same as concealed, except with hardwood plywood or medium density overlay, Grade MDO EXT-101; smooth surface with no grooves.

G. Interior Plywood (Transparent Finish):
   1. Exterior type plywood, Grade A veneers on exposed surfaces, Grade B veneers on semi-exposed surfaces, and Grade D or better veneers on concealed surfaces.
      (a) Birch: (Natural) (Select) (Rotary Cut) (Red) (White).
      (b) Oak: (Rotary Cut) (Plain Sliced) (Red) (White).

H. Lumber Standard:
   2. Nominal sizes are shown or specified, except as shown by actual dimensions.
   3. Provide actual sizes complying with minimum size requirements for PS-20 for moisture content specified for each use.
   4. Moisture Content: Seasoned lumber with 19 percent maximum moisture content at time of dressing and complying with dry size requirements of PS-20, unless otherwise specified.

I. Boards:
   1. Complying with dry size requirements of PS-20 where lumber less than 2 inches in nominal thickness and 2 inches or more in nominal width is shown or specified.
J. Dimension Lumber and Timber:
   1. Lumber complying with grading rules under provisions of requirements of National Grading Rule for Dimension Lumber of American Lumber Standards Committee established under PS-20.
   2. Light Framing (2 inches minimum thickness and 4 inches minimum width): “Stud” grade lumber for stud framing and “standard” grade for other light framing.

K. Miscellaneous Materials:
   1. Fasteners and Anchorages:
      (a) Provide size, type, material, and finish and as recommended by applicable standards, complying with applicable Federal Specifications for nails, staples, screws, bolts, nuts, washers, and anchoring devices.
      (b) Provide metal hangers and framing anchors of size and type recommended by the manufacturer for each use including recommended nails.
      (c) Where rough carpentry Work is exposed to weather, in ground contact, or in area of high relative humidity, provide fasteners and anchorages with hot-dip zinc, ASTM A153.
   2. Building Paper: ASTM D226, Type I; asphalt saturated felt, non-perforated, 15-pound type.

L. Treated Wood: Under provisions of Section 06300 - Wood Treatment.

PART 3 EXECUTION

3.1 PREPARATION

A. Protect installed carpentry Work from damage by Work of other trades until accepted by the Owner.
   1. Review proposed protection methods with Architect and Owner for acceptance.

B. Examine substrates, adjoining construction, and conditions where Work is to be installed.

C. Do not proceed with Work where unsatisfactory conditions exist.

D. Where rough carpentry is fitted to other Work, obtain measurements of other Work and verify dimensions shown on shop drawing details.

E. Apply heavy brush coat of same chemical treatment material to surfaces exposed by sawing, cutting, or drilling.

3.2 INSTALLATION

A. Materials: Use only sound, thoroughly seasoned materials of longest practical lengths and sizes to minimize jointing, free from warp that cannot be easily corrected by anchoring and attachment.

B. Installation
1. Closely fit and accurately set members to required lines and levels, and rigidly secure in place.

2. Attachment and Anchorage:
   (a) Ensure nail size and nail spacing is sufficient to develop adequate strength for connection without splitting the member.
   (b) Countersink nail heads on exposed carpentry Work and fill holes.
   (c) Provide hot dip galvanized finish for anchors and attachments, except where otherwise shown
   (d) Use common wire nails, except as otherwise shown or specified.
   (e) Use finishing nails for finish Work.
   (f) Select fasteners of size that shall not penetrate members where opposite side will be exposed to view or shall receive finish materials.
   (g) Make tight connections between members.
   (h) Install fasteners without splitting wood, pre-drill as necessary.

3. Wood Grounds, Nailers, Blocking, and Sleepers:
   (a) Provide as shown and as required for screeding or attachment of other Work.
   (b) Form to shapes as shown and cut as required for true line and level of Work to be attached.
   (c) Set true to line and level, plumb, with intersections true to required angle.
   (d) Coordinate location with other work involved.
   (e) Provide wood blocking to strengthen and supplement horizontal metal stud framing members between studs required for recessed and surface mounted items including, but not limited to, cabinets, finish hardware, magnetic door holding devices, markerboards.
   (f) Cut blocking to fit between framing members and rigidly attach thereto.
   (g) Secure blocking and nailers to building structure as indicated and as specified.
   (h) Provide wood grounds for attachment of finish trim and other Work to plaster.
   (i) Grounds: Dressed, preservative treated. Use key-beveled lumber not less than 2-inch nominal width and of thickness required to bring face of ground to exact thickness of finish material involved.
   (j) Remove temporary grounds when not longer required.

4. Roof Sheathing: Nail or staple to framing and use spacer clips at edges for expansion and construction control.

END OF SECTION
SECTION 09 24 00 - PORTLAND CEMENT PLASTER

PART 1 GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 - General Requirements, apply to work specified in this Section.

1.2 SECTION INCLUDES:

A. See plans and schedules for the extent of plasterwork.
B. The type of plastering required includes:
   1. Portland Cement Plaster (Stucco).
   2. Smooth, aggregate and special rendered surface finishing.

1.3 REFERENCES

A. ASTM C91 – Standard Specification for Masonry Cement
J. NTMA - National Tile and Marble Association
K. PCA (Portland Cement Association) - Plaster (Stucco) Manual

1.4 SYSTEM DESCRIPTION

A. Fabricate vertical elements to limit finish surface to 1/180 deflection under lateral point load of 100 lbs.
B. Fabricate horizontal elements to limit finish surface to 1/260 deflection under superimposed dead loads and wind uplift loads.
C. LEED Submittals:
   1. Product data for Credit MR 4, indicating material cost, percent post-consumer and/or pre-consumer recycled content by weight.
   2. Product data for Credit MR 5, indicating material cost, manufacturing location(s), and location(s) of extraction/harvesting/recovery of raw/scrap material(s).

1.5 QUALITY ASSURANCE:

A. Cement Plaster: Perform work in accordance with ASTM C926.
B. Allowable Tolerances: For flat surfaces, do not exceed 1/8" to 10'-0" for bow, warp, plumb or level, including surfaces to receive applied finishes (tile, etc.).
C. This Contractor shall make sample panels at the site at least 4' x 4' of each type of plasterwork.
   1. The Architect and Owner shall accept the panels before Contractor starts plastering.
   2. The accepted panels will be a basis for all work.
D. Applicator shall show proof of specializing in lath and plaster work for a minimum of 5-years.
1.6 SUBMITTALS:

A. Submit under the provisions of Section 01 33 00.
B. Manufacturer's Data Plaster:
   1. For information only, submit copies of the manufacturer's product specifications and installation instructions for each material, and include other data as may be required to show compliance with these specifications.
   2. Distribute an additional copy of each installation instruction to the Installer.

1.7 REGULATORY REQUIREMENTS

A. Conform to ASTM E119 and applicable code for fire rated assemblies as follows:
   1. Fire Rated Partitions: Listed assembly by UL or FM.
   2. Fire Rated Ceiling and Soffits: Listed assembly by UL or FM
   3. Fire Rated Structural Column Framing: Listed assembly by UL or FM.
   4. Fire Rated Structural Beam Framing: Listed assembly by UL or FM.

1.8 PRODUCT HANDLING:

A. Except for sand and water, deliver materials to the site in sealed containers or bags fully identified with manufacturer's name, brand, type, and grade.
B. Store all materials in a dry, well-ventilated space, under cover and off the ground.

1.9 JOB CONDITIONS:

A. Installer must examine surfaces that are to receive plaster, repair, alter and prepare surfaces to insure a timely completion of the work.
   1. Do not start the plasterwork until any unsatisfactory conditions are corrected in an acceptable manner to the Installer and Architect.
B. Temporary Heat and Ventilation: Comply with ANSI A42.1 and A42.2 as applicable to the work.
C. Do not apply plaster when ambient temperature is less than 50°F both during installation and until cured.
D. Protect contiguous work from soiling, spattering, moisture deterioration and other harmful effects, which might result from plastering.

PART 2 PRODUCTS

2.1 PLASTER BASE COAT MATERIALS:

A. Cement: ASTM C150, Type I Portland.
B. Lime: ASTM C206, Type S.
C. Aggregate: In accordance with ASTM C897.
D. Water: Clean, fresh, potable and free of mineral or organic material that may affect plaster.
E. Bonding Agent
F. Bonding Agent: ASTM C631; type recommended for bonding plaster to concrete and concrete masonry surfaces.
G. Admixtures: Air entrainment.

2.2 PLASTER FINISH COAT MATERIALS:

A. Cement: As specified for plaster base coat.
B. Lime: As specified for plaster base coat.
C. Color Pigment: Mineral oxide.
D. Water: Clean, fresh, potable and free of mineral or organic matter that can affect plaster.
2.3 CEMENT PLASTER MATERIALS (STUCCO):

A. Job mixed Stucco - Mix bondcrete or mortaseal mason's lime with Portland cement and sand according to ASTM C926, in Portland cement: lime: sand ratios (bags: bags: cu ft) as follows:
   2. Finish - Apply exterior stucco finish in accordance with U.S. Gypsum data sheet P-541.
   3. Skim Coat: Provide smooth textured skim coat where scheduled on drawings.
   4. Finish Texture: As shown on the drawings and/or finish schedule.
      a. Contractor to provide sample mock-up of textures as directed by Architect for finish selection. Final finish selection is not to be used as final in-place work.
      b. Work may not start until finish (texture) has been selected by Architect.

PART 3 EXECUTION

3.1 PREPARATION FOR PLASTERING:

A. Clean plaster bases and substrates to be plastered, removing loose materials, coatings, and other substances that might impair the work.
B. Etch concrete and masonry surfaces indicated for direct plastering.
   1. Wet surface, scrub with acid etch solution, and rinse thoroughly; repeat if necessary for adequate plaster bond.
C. Apply dash-coat on concrete surfaces receiving direct plastering, and moisture-cure for 2 days.
D. Apply bonding agent on interior concrete surfaces indicated for direct plastering; comply with manufacturer's instructions.
E. Cover chases and similar openings in the surfaces to receive plaster with lath strip reinforcing, extending not less than 6" beyond edges of opening.
   1. Securely fasten lath along edges.
F. Install temporary grounds and screeds as required to control plaster thickness and comply with tolerances.
G. Install plastering accessories, anchored to substrates 8" o. c. along each flange.
   1. Miter corners and spline joints to form tight accurate joints without offsets.
   2. Install screws in all accessories at a maximum of 4'0" o. c. as well as clinched into place.
   3. Install resilient-edged casing beads for interior work against exterior-wall door and window frames, and at similar locations as indicated.
   4. Control Joints: Install control joints at locations indicated, or if not indicated, at locations complying with the following criteria and approved by Architect.
      a. Where an expansion or control joint occurs in surface of construction directly behind plaster membrane.
      b. Where distance between control joints exceed 10' in either direction.
      c. Where area within panels exceed 100 sq.ft.
      d. Where panel sizes or dimensions change, extend joints full width or height.
      e. Coordinate all locations with Architect at Pre-installation meeting.
H. Surface Conditioning: Immediately before applying plaster to concrete or masonry, except when using a bonding agent, dampen the surfaces sufficiently to obtain optimum plaster suction.

3.2 INSTALLATION OF PLASTER:

A. General: Comply with ASTM C926; except comply with manufacturer's instructions where more detailed or more stringent.
B. Plaster Thickness and Number of Coats:
   1. Thickness on Vertical Surfaces: Except as otherwise indicated or specified, the minimum thickness of plaster as measured from face of lath, masonry, or concrete to finished plaster surfaces shall be as follows:
      a. Exterior Portland Cement Plaster: %".
b. Interior Portland Cement Plaster: ¾".
c. Plaster on unit masonry surfaces: ½".
d. Plaster on concrete surfaces: ⅝"
e. Plaster skim coat on interior masonry surfaces: ¼"

2. Thickness on Horizontal Surfaces: Per ASTM C926

3. Number of Coats: Plaster on unit masonry surfaces 2 coats; on concrete or applied over bonding agents, 3 coats; doubling back with brown coat over scratch coat before it is partially dry and set will not be permitted on 3 coat work.

C. Mechanically mix plaster materials at the project site; do not hand mix except where small amounts of less than one bag are needed.

D. Sequence plaster installation properly with the installation and protection of other work, so that neither will be damaged by the installation of the other.

E. Apply skim-coat plaster with a minimum thickness scratch and leveling coat and a normal minimum thickness finish coat.

F. Cure Plaster by maintaining each coat in a moist condition for two days following application; keep enclosed and fog-spray (after initial set) as required to prevent dry-out.

G. All Exterior vertical surfaces shall have hand struck tooled joints and score line. Slope bottom edge of horizontal score lines to dispel water.

H. All Exterior window sills to receive plaster must be sloped to dispel water whether shown on construction documents or not.

3.3 CUTTING AND PATCHING:

A. Cut, patch, point-up and repair plaster as necessary to accommodate other work and to restore cracks, dents, and imperfections.

B. Repair or replace work to eliminate blisters, buckles, excessive crazing and check crackling, dry-outs, efflorescence, sweat-outs, and similar defects, including areas of the work which do not comply with specified tolerances, and where bond to the substrate has failed.

C. Sand smooth-trowel finishes lightly to remove trowel marks and arises.

3.4 CLEANING AND PROTECTION:

A. Remove temporary protection and enclosure of other work.
   1. Promptly remove plaster from doorframes, windows, and other surfaces not being plastered.
   2. Repair floors, walls, and other surfaces stained, marred, or damaged from plastering work.
   3. When plastering work is complete, remove unused materials, containers, and equipment, clean floors of plaster debris.

B. Installer shall advise the Contractor of requirements for the protection of plaster from deterioration and damage during the remainder of the construction period.

END OF SECTION
PART 1 GENERAL

1.1 SECTION INCLUDES:

A. Surface preparation.

B. Field application of primers, paints, stains, and other coatings for exterior and interior items and surfaces.

1.2 SYSTEM DESCRIPTION

A. Paint exposed surfaces, except where these Specifications indicate that the surface or material is not to be painted or is to remain natural. If an item or a surface is not specifically mentioned, paint the item or surface the same as similar adjacent materials or surfaces. If a color of finish is not indicated, Architect will select from standard colors and finishes available.

1. Painting includes field painting of exposed bare and covered pipes and ducts (including color coding), hangers, exposed steel and iron supports, and surfaces of mechanical and electrical equipment that do not have a factory-applied final finish.

2. Surface preparation, priming, and finish coats specified in this Section are in addition to shop priming and surface treatment specified in other Sections.

B. Do not paint prefinished items, concealed surfaces, finished metal surfaces, operating parts, and labels.

1. Prefinished items include the following factory-finished components:

   (a) Finished mechanical and electrical equipment.
   (b) Light fixtures.

2. Concealed surfaces include walls or ceilings in the following generally inaccessible spaces:

   (a) NA

3. Finished metal surfaces include the following:

   (a) Anodized aluminum.
   (b) Stainless steel.

4. Operating parts include moving parts of operating equipment and the following:

   (a) NA

5. Labels: Do not paint over UL, FMG, or other code-required labels or equipment name, identification, performance rating, or nomenclature plates.

C. Alternates: Refer to Division 1 Section "Alternates" for description of Work in this Section affected by alternates.
1.3 REFERENCES

A. American Society for Materials and Testing (ASTM).
   3. D4262-pH of Chemically Cleaned or Etched Concrete Surfaces.
   4. D4263-Indicating Moisture in Concrete by the Plastic Sheet Method.

B. Environmental Protection Agency (EPA).

C. Factory Mutual Global (FMG).

D. NACE International the Corrosion Society.


H. Painting and Decorating Contractors Association (PDCA) P4-Responsibility for Inspection and Acceptance of Surfaces Prior to Painting and Decorating.

I. Society of Protective Coatings (SSPC) SP6-Commercial Abrasion Blast.


K. Underwriter’s Laboratory (UL).

1.4 DEFINITIONS

A. General: Standard coating terms defined in ASTM D16 apply to this Section.
   1. Flat: Lusterless or matte finish with a gloss range below 15 when measured at an 85 degree meter.
   2. Eggshell: Low-sheen finish with a gloss range between 20 and 35 when measured at a 60 degree meter.
   3. Semi-gloss: Medium-sheen finish with a gloss range between 35 and 70 when measured at a 60 degree meter.
   4. Full gloss: High-sheen finish with a gloss range more than 70 when measured at a 60 degree meter.

1.5 SUBMITTALS
A. **Product Data:** For each paint system indicated. Include block fillers and primers.

1. **Material List:** An inclusive list of required coating materials. Indicate each material and cross-reference specific coating, finish system, and application. Identify each material by manufacturer's catalog number and general classification.

2. **Manufacturer's Information:** Manufacturer's technical information, including label analysis and instructions for handling, storing, and applying each coating material.

3. **Low Emitting Materials:**
   - **(a)** Submit manufacturer’s Material Safety Data Sheet indicating VOC limits of all products.
   - **(b)** Submit manufacturer’s certification for all architectural paint, coating, and primer products applied to interior walls and ceilings that comply with the Green Seal Certification standard GS-11, Paints First Edition, May 20, 1993.

B. **Samples for Verification:** For each color and material to be applied, with texture to simulate actual conditions, on representative Samples of the actual substrate.

1. Provide stepped Samples, defining each separate coat, including block fillers and primers. Use representative colors when preparing Samples for review. Resubmit until required sheen, color, and texture are achieved.

2. Provide a list of materials and applications for each coat of each Sample. Label each Sample for location and application.

3. Submit Samples on the following substrates for Architect’s review of color and texture only:
   - **(a)** Concrete: 4 inch square samples for each color and finish.
   - **(b)** Concrete Unit Masonry: 4 by 8-inch samples of masonry, with mortar joint in the center, for each finish and color.
   - **(c)** Painted Wood: 8 inch square samples for each color and material on hardboard.
   - **(d)** Stained or Natural Wood: 4 by 8 inch samples of natural or stained-wood finish on representative wood surfaces.
   - **(e)** Ferrous Metal: 3 inch square samples of flat metal and 6-inch long samples of solid metal for each color and finish.

C. **Warranty.**

### 1.6 QUALITY ASSURANCE

A. **Applicator Qualifications:** Paint applicator shall be licensed in the State of Florida or in Leon County and use state or county journeymen. Provide a legible copy of license and, when applicable a journeyman’s certification attesting to qualification requirements.

1. **Certifications:** Paint applicator shall provide a certification attesting to having worked on projects similar in scope to this project for a minimum of 5 years. Paint
applicator not providing such documentation or not having the required experience will be removed from the project and replaced by the Contractor.

B. Source Limitations: Obtain block fillers and primers for each coating system from the same manufacturer as the finish coats.

C. Benchmark Samples (Mockups): Provide a full-coat benchmark finish sample for each type of coating and substrate required. Comply with procedures specified in PDCA P5. Duplicate finish of approved sample Submittals.

   1. Architect will select one room or surface to represent surfaces and conditions for application of each type of coating and substrate.
      (a) Wall Surfaces: Provide samples on at least 100 sq. ft.
      (b) Small Areas and Items: Architect will designate items or areas required.

   2. Apply benchmark samples, according to requirements for the completed Work, after permanent lighting and other environmental services have been activated. Provide required sheen, color, and texture on each surface.
      (a) After finishes are accepted, Architect will use the room or surface to evaluate coating systems of a similar nature.

D. Final approval of colors will be from benchmark samples.

E. Conform to ASTM for interpretation of terms used in this Section.

F. Labels: Do not paint over Underwriter’s Laboratories (UL), Factory Mutual (FM) or other code required labels or equipment name, identification, performance rating, or nomenclature plates.

G. Regulatory Requirements: Conform to applicable code for flame/fuel/smoke rating requirements for finishes.

H. Single Source Responsibility: Provide primers, paints, stains and other coatings for exterior and interior items and surfaces by the same manufacturer.

1.7 DELIVERY, STORAGE, AND HANDLING

A. Deliver materials to Project site in manufacturer's original, unopened packages and containers bearing manufacturer's name and label and the following information:

   1. Product name or title of material.
   2. Product description (generic classification or binder type).
   3. Manufacturer's stock number and date of manufacture.
   4. Contents by volume, for pigment and vehicle constituents.
   5. Thinning instructions.
   6. Application instructions.
7. Color name and number.

8. VOC content.

B. Store materials not in use in tightly covered containers in a well-ventilated area at a minimum ambient temperature of 45 degrees F and a maximum temperature of 90 degrees F. Maintain storage containers in a clean condition, free of foreign materials and residue.

1. Keep storage area neat and orderly. Remove oily rags and waste daily.

C. Container Labeling: Include manufacturer's name, type of paint, brand name, brand code, coverage, surface preparation, drying time, cleanup, color designation, and instructions for mixing.

D. Store and mix materials in 1 area only.

E. Comply with health and fire regulations. Take precautionary measures to prevent fire hazards and spontaneous combustion.

1.8 PROJECT CONDITIONS

A. Allow sufficient time for stucco and plaster to moist cure in accordance with Section 09220-Portland Cement Plaster (Stucco). The pH factor and moisture level of all areas to receive primer or paint shall be tested and confirmed.

1. pH factor shall be below 10.
2. Moisture content shall be below 80.
3. Provide a written record of each such test.
4. “Hot” primer shall not be permitted until the pH is below 10.

B. Comply with manufacturer's recommendations as to environmental conditions under which coatings and coating systems can be applied.

C. Do not do any painting if the relative humidity exceeds 90 percent.

D. Do not apply finish in areas where dust is being generated.

E. Cover or otherwise protect finished work of other trades and surfaces not being painted concurrently or not to be painted.

F. Do not apply paint in snow, rain, fog, or mist; or when relative humidity exceeds 85 percent; or at temperatures less than 5 degrees F above the dew point; or to damp or wet surfaces.

1. Painting may continue during inclement weather if surfaces and areas to be painted are enclosed and heated within temperature limits specified by manufacturer during application and drying periods.

G. Provide continuous ventilation to maintain surface and ambient temperatures 24 hours before, during and 48 hours after painting.

H. Provide lighting levels of 50 foot candles at mid-height at substrate surface.

1.9 WARRANTY
A. Provide a written guarantee, co-signed jointly and severally by the Contractor, painting subcontractor, and materials manufacturers, against cracking, peeling flaking, chalking and mildew on interior surfaces, and additionally against erosion and unreasonable fading or exterior surfaces, for 6 years; agreeing to repair and repaint surfaces affected by such defects, at no cost to the Owner, including necessary removal or protection of other work, without limit, within 30 days after notification by the Owner, and to perform such work based on the provisions of this section, including extension of the guarantee to cover new work.

1.10 EXTRA STOCK

A. Provide “Home Store” data (where painter purchased the paints used on the project) include all paint records and the following Home Store information:
   1. Name.
   2. Address.
   3. Telephone number.
   4. Store manager name.
   5. List of paints purchased by name and type.

B. Provide a 1 gallon container of each color and surface texture of respective finish paints used on the project.

C. Label each container with color, texture and room locations, in addition to the manufacturer’s label.

D. Deliver and store extra stock at the time of substantial completion.

PART 2 PRODUCTS

2.1 MANUFACTURERS

A. Subject to compliance with the specified requirements, provide products by one of the following manufacturers:
   1. Benjamin Moore & Co.
   2. Coronado Paint Co.
   3. Duron, Inc.
   4. ICI Paint Stores, Inc.
   5. MAB Paints.
   6. PPG Architectural Finishes, Inc.
   7. (Basis of Design) Sherwin-Williams Company.

2.2 PAINT MATERIALS, GENERAL
A. Material Compatibility: Provide block fillers, primers, and finish-coat materials that are compatible with one another and with the substrates indicated under conditions of service and application, as demonstrated by manufacturer based on testing and field experience.

B. Material Quality: Provide manufacturer's best-quality paint material of the various coating types specified that are factory formulated and recommended by manufacturer for application indicated. Paint-material containers not displaying manufacturer's product identification will not be acceptable.

1. Proprietary Names: Use of manufacturer's proprietary product names to designate colors or materials is not intended to imply that products named are required to be used to the exclusion of equivalent products of other manufacturers.

C. Colors: As selected by Architect from manufacturer's full range.

D. Millage noted below is minimum acceptable dry film thickness per coat application.

E. Toxicity/IEQ: All interior paint and coating products are to comply with any of the following which apply:

   1. All architectural paints, coatings, and primers applied to interior walls and ceilings are to comply with the Green Seal Standard GS-11, First Edition, May 20, 1993.


2.3 VOC CONTENT

A. Products are specified must not exceed the following:

   1. Interior Coatings (weight in grams/liter of product):
      (a) Non-Flat: 150.
      (b) Flat: 50.

   2. Exterior Coatings weight in grams/liter of product minus water):
      (a) Non-Flat: 200.
      (b) Flat: 100.

2.4 CONCRETE UNIT MASONRY BLOCK FILLERS

A. Concrete Unit Masonry Block Filler: Factory-formulated high-performance latex block fillers.

   1. Sherwin-Williams; PrepRite Block Filler (B25W25): Applied at a dry film thickness of not less than 8 mils per coat.
      (a) Meets GS-11.
      (b) Meets FSPMA MP-33.1 Block Filler, Latex-Base, Interior-Exterior Flat, White.

2.5 EXTERIOR PRIMERS
A. **Exterior Concrete and Masonry Primer-New Construction**: Factory-formulated alkali-resistant acrylic-latex primer for exterior application.
   1. Sherwin-Williams; Loxon Acrylic Primer (A24W300): Applied at a dry film thickness of not less than 3.2 mils per coat.

B. **Exterior Concrete and Masonry Primer-for Elastomeric Coatings**: Factory-formulated alkali-resistant acrylic-latex primer for exterior application
   1. Sherwin-Williams; Loxon Acrylic Primer (A24W300): Applied at a dry film thickness of not less than 3.2 mils per coat.

C. **Exterior Concrete and Masonry Primer-for Existing Construction**: Factory-formulated alkali-resistant Acrylic primer for exterior application
   1. Sherwin-Williams; Loxon Conditioner (A24W100): Applied at a spread rate of 200-300 square feet per gallon.

D. **Exterior Wood Primer for Acrylic Enamels**: Factory-formulated alkyd or latex wood primer for exterior application.
   1. Sherwin-Williams; A-100 Exterior Oil Stain Blocking Primer (Y24W20): Applied at a dry film thickness of not less than 2.3 mils per coat.

   or

   2. Sherwin-Williams; A-100 Exterior Latex Primer (B42W41/B42W43): Applied at a dry film thickness of not less than 1.4 mils per coat.

E. **Exterior Ferrous-Metal Primer**: Factory-formulated rust-inhibitive metal primer for exterior application.
   1. Sherwin-Williams; Pro-Cryl Universal Primer (B66-310 Series): Applied at a dry film thickness of not less than 2.0 mils per coat (acrylic-based).

   (a) Meets GS-11.

   (b) Meets FSPMA MP-26.3 “Recommended Primer” under Sherwin-Williams DTM Acrylic Gloss Coating (B66 Series).

F. **Exterior Zinc-Coated Metal Primer**: Factory-formulated galvanized metal primer for exterior application.
   1. Sherwin-Williams; Pro-Cryl Universal Primer (B66-310 Series): Applied at a dry film thickness of not less than 2.0 mils per coat.

   (a) Meets GS-11.

   (b) Meets FSPMA MP-26.3 “Recommended Primer” under Sherwin-Williams DTM Acrylic Gloss Coating (B66 Series).

G. **Exterior Aluminum Primer under Acrylic Finishes**: Factory-formulated acrylic-based metal primer for exterior application.
   1. Sherwin-Williams; Pro-Cryl Universal Primer (B66-310 Series): Applied at a dry film thickness of not less than 2.0 mils per coat.

   (a) Meets GS-11.
2.6 INTERIOR PRIMERS

A. Interior Concrete, Masonry, and Brick Primer: Factory-formulated alkali-resistant acrylic-latex interior primer for interior application.

1. Sherwin-Williams; ProGreen 200 Low VOC Interior Latex Primer (B28W600): Applied at a dry film thickness of not less than 1.5 mils per coat.
   
   (a) Meets GS-11.

B. Interior Gypsum Board Primer: Factory-formulated latex-based primer for interior application.

1. Sherwin-Williams; ProGreen 200 Low VOC Interior Latex Primer (B28W600): Applied at a dry film thickness of not less than 1.5 mils per coat.
   
   (a) Meets GS-11.

C. Interior Plaster Primer: Factory-formulated latex-based primer for interior application.

1. Sherwin-Williams; ProGreen 200 Low VOC Interior Latex Primer (B28W600): Applied at a dry film thickness of not less than 1.5 mils per coat.
   
   (a) Meets GS-11.

D. Interior Wood Primer for Acrylic-Enamel: Factory-formulated acrylic-latex-based interior wood primer.

1. Sherwin-Williams; Harmony Interior Latex Primer (B11W900): Applied at a dry film thickness of not less than 1.3 mils per coat.
   
   (a) Meets GS-11.

   or

2. S-W PrepRite ProBlock Latex Primer, B51 Series (4 mils wet, 1.4 mils dry).


1. Sherwin-Williams; ProCryl Universal Primer (B66-310 Series): Applied at a dry film thickness of not less than 2.0 mils per coat.

F. Interior Zinc-Coated Metal Primer: Factory-formulated galvanized metal primer.

1. Sherwin-Williams; ProCryl Universal Primer (B66-310 Series): Applied at a dry film thickness of not less than 2.0 mils per coat.
   
   (a) Meets GS-11.

G. Interior Unit Masonry, Gypsum Board and Plaster: Factory-formulated primer for Epoxy finish.
1. Sherwin-Williams; ProGreen 200 Low VOC Interior Latex Primer (B28W600): Applied at a dry film thickness of not less than 1.5 mils per coat.
   (a) Meets GS-11.

2.7 EXTERIOR FINISH COATS

A. Exterior Low-Luster Acrylic Elastomeric: Factory-formulated low sheen 100% Acrylic Elastomeric coating for exterior application. Note: Use elastomerics only after receiving approval in writing from the Owner.
   1. Sherwin-Williams; SherLastic Elastomeric Coating (A5-100 Series): Applied at a dry film thickness of not less than 6.0 mils per coat.

   1. Sherwin-Williams; A-100 Exterior Latex Satin (A82 Series): Applied at a dry film thickness of not less than 1.3 mils per coat.

C. Exterior Semigloss Acrylic Enamel: Factory-formulated semigloss waterborne acrylic-latex enamel for exterior application.
   1. Sherwin-Williams; DTM Acrylic Coating (B66-200 Series–Semi-Gloss) Applied at a dry film thickness of not less than 2.5 mils per coat.
   (a) Meets GS-11.
   (b) Meets FSPMA MP-26.3 Acrylic-Base Gloss Enamel, Metal Surfaces, Whites and Tints.

   1. Sherwin-Williams; DTM Acrylic Coating (B66-100 Series-Gloss): Applied at a dry film thickness of not less than 2.5 mils per coat.

2.8 INTERIOR FINISH COATS

A. Interior Flat Acrylic Paint: Factory-formulated flat acrylic-emulsion latex paint for interior application.
   1. Sherwin-Williams; ProGreen 200 Low VOC Interior Latex Flat (B30-600 Series): Applied at a dry film thickness of not less than 1.3 mils per coat.
   (a) Meets GS-11.

B. Interior Flat Latex-Emulsion Size: Factory-formulated flat latex-based interior paint.
   1. Sherwin-Williams; Harmony Interior Latex Flat (B5 Series): Applied at a dry film thickness of not less than 1.7 mils per coat.
   (a) Meets GS-11.

C. Interior Low Luster Latex Paint: Factory-formulated eggshell latex based interior paint.
1. Sherwin-Williams; Harmony Interior Latex Eg-Shel (B9 Series): Applied at a dry film thickness of not less than 1.6 mils per coat.
   
   (a) Meets GS-11.

D. Interior **Low-Luster Acrylic Enamel**:

1. Sherwin-Williams; ProGreen 200 Low VOC Interior Latex Eg-Shel (B20-600 Series): Applied at a dry film thickness of not less than 1.7 mils per coat.
   
   (a) Meets GS-11.

E. Interior **Semi-gloss Acrylic Enamel**: Factory-formulated semi-gloss acrylic-latex enamel for interior application.

1. Sherwin-Williams; ProGreen 200 Interior Latex Semi-Gloss (B31-600 Series): Applied at a dry film thickness not less than 1.6 mils per coat.
   
   (a) Meets GS-11.

F. Interior **Full-Gloss Acrylic Enamel**:

1. Sherwin-Williams; Pro Industrial Zero VOC Acrylic Gloss (B66W600): Applied at a dry film thickness of not less than 2.5 mils per coat.

G. Interior **Semi-gloss Waterborne Acrylic Epoxy**: Factory-formulated semi-gloss acrylic epoxy coating of interior application.

1. Sherwin-Williams; Water-Based Catalyzed Epoxy (Two Component) (B70W211/B60V15): Applied at a dry film thickness of not less than 2.5 mils per coat.

2. S-W Pro Industrial Pre-Catalyzed Waterbased Epoxy, K46W150 Series.
   
   (a) Meets GS-11.


2.9 **INTERIOR WOOD STAINS AND VARNISHES**

A. Open-Grain Wood Filler: Factory-formulated paste wood filler applied at spreading rate recommended by manufacturer.

1. Sherwin-Williams; Sher-Wood Natural Filler (D70T1).

B. Interior Wood Stain: Factory-formulated alkyd-based penetrating wood stain for interior application applied at spreading rate recommended by manufacturer.

1. S-W Minwax 250 VOC Wood Stain

C. Interior Waterborne Clear Satin Varnish: Factory-formulated clear satin acrylic-based polyurethane varnish applied at spreading rate recommended by manufacturer.
1. 2 Coats-Sherwin-Williams; Wood Classics Waterborne Polyurethane Varnish-Satin (A68 Series): Applied at a dry film thickness of not less than 0.8 mils per coat.

D. Interior Waterborne Stain Full-Gloss Varnish:

1. 2 Coats-Sherwin-Williams; Wood Classics Waterborne Polyurethane Varnish-Gloss (A68 Series): Applied at a dry film thickness of not less than 0.8 mils per coat.

PART 3 EXECUTION

3.1 EXAMINATION

A. Examine substrates, areas, and conditions, with applicator present, for compliance with requirements for paint application. Comply with procedures specified in PDCA P4.

1. Proceed with paint application only after unsatisfactory conditions have been corrected and surfaces receiving paint are thoroughly dry.
2. Start of painting will be construed as Applicator's acceptance of surfaces and conditions within a particular area.

B. Coordination of Work: Review other Sections in which primers are provided to ensure compatibility of the total system for various substrates. On request, furnish information on characteristics of finish materials to ensure use of compatible primers.

3.2 PREPARATION

A. General: Remove hardware and hardware accessories, plates, machined surfaces, lighting fixtures, and similar items already installed that are not to be painted. If removal is impractical or impossible because of size or weight of the item, provide surface-applied protection before surface preparation and painting.

1. After completing painting operations in each space or area, reinstall items removed using workers skilled in the trades involved.

B. Cleaning: Before applying paint or other surface treatments, clean substrates of substances that could impair bond of the various coatings. Remove oil and grease before cleaning.

1. Schedule cleaning and painting so dust and other contaminants from the cleaning process will not fall on wet, newly painted surfaces.

C. Surface Preparation: Clean and prepare surfaces to be painted according to manufacturer's written instructions for each particular substrate condition and as specified.

1. Provide pull tests on existing painted surfaces where a different coating will be applied. Verify with the manufacturer that the coatings are compatible.
2. Provide barrier coats over incompatible primers or remove and reprime.
3. Cementitious Materials: Prepare concrete, concrete unit masonry, cement plaster, and mineral-fiber-reinforced cement panel surfaces to be painted. Remove efflorescence, chalk, dust, dirt, grease, oils, and release agents. Roughen as required to remove glaze. If hardeners or sealers have been used to improve curing, use mechanical methods of surface preparation.
(a) Use abrasive blast-cleaning methods if recommended by paint manufacturer.
(b) Determine alkalinity pH and moisture content of surfaces by performing appropriate tests. If surfaces are sufficiently alkaline to cause the finish paint to blister and burn, correct this condition by approved curing methods in Section 09220-Portland Cement (Stucco). Do not paint surfaces if moisture content exceeds that permitted in manufacturer's written instructions.
(c) Clean concrete floors to be painted with a 5 percent solution of muriatic acid or other etching cleaner. Flush the floor with clean water to remove acid, neutralize with ammonia, rinse, allow to dry, and vacuum before painting.

4. Wood: Clean surfaces of dirt, oil, and other foreign substances with scrapers, mineral spirits, and sandpaper, as required. Sand surfaces exposed to view smooth and dust off.

(a) Scrape and clean small, dry, seasoned knots, and apply a thin coat of white shellac or other recommended knot sealer before applying primer. After priming, fill holes and imperfections in finish surfaces with putty or plastic wood filler. Sand smooth when dried.
(b) Prime, stain, or seal wood to be painted immediately on delivery. Prime edges, ends, faces, undersides, and back sides of wood, including cabinets, counters, cases, and paneling.
(c) If transparent finish is required, backprime with non-yellowing varnish.
(d) Backprime paneling on interior partitions where masonry, plaster, or other wet wall construction occurs on backside.
(e) Seal tops, bottoms, and cutouts of unprimed wood doors with a heavy coat of varnish or sealer immediately on delivery.

5. Ferrous Metals: Clean ungalvanized ferrous-metal surfaces that have not been shop coated; remove oil, grease, dirt, loose mill scale, and other foreign substances. Use solvent or mechanical cleaning methods that comply with the Steel Structures Painting Counsel's recommendations.

(a) Blast steel surfaces clean as recommended by paint system manufacturer and according to SSPC-SP 6/NACE No. 3.
(b) Treat bare and sandblasted or pickled clean metal with a metal treatment wash coat before priming.
(c) Touch up bare areas and shop-applied prime coats that have been damaged. Wire-brush, clean with solvents recommended by paint manufacturer, and touch up with same primer as the shop coat.

6. Galvanized Surfaces: Clean galvanized surfaces with nonpetroleum-based solvents so surface is free of oil and surface contaminants. Remove pretreatment or “passivators” from galvanized sheet metal fabricated from coil stock by mechanical methods SSPC-SP 7.

D. Material Preparation: Mix and prepare paint materials according to manufacturer's written instructions.

1. Maintain containers used in mixing and applying paint in a clean condition, free of foreign materials and residue.
2. Stir material before application to produce a mixture of uniform density. Stir as required during application. Do not stir surface film into material. If necessary, remove surface film and strain material before using.

3. Use only thinners approved by paint manufacturer and only within recommended limits.

E. Tinting: Tint each undercoat a lighter shade to simplify identification of each coat when multiple coats of same material are applied. Tint undercoats to match the color of the finish coat, but provide sufficient differences in shade of undercoats to distinguish each separate coat.

3.3 APPLICATION

A. General: Apply paint according to manufacturer's written instructions. Use applicators and techniques best suited for substrate and type of material being applied.

1. Paint colors, surface treatments, and finishes are indicated in the paint schedules.

2. Do not paint over dirt, rust, scale, grease, moisture, scuffed surfaces, or conditions detrimental to formation of a durable paint film.

3. Provide finish coats that are compatible with primers used.

4. The term "exposed surfaces" includes areas visible when permanent or built-in fixtures, grilles, convector covers, covers for finned-tube radiation, and similar components are in place. Extend coatings in these areas, as required, to maintain system integrity and provide desired protection.

5. Paint surfaces behind movable equipment and furniture the same as similar exposed surfaces. Paint surfaces behind permanently fixed equipment and furniture with prime coat only.

6. Paint interior surfaces of ducts with a flat, nonspecular black paint where visible through registers or grilles.

7. Paint back sides of access panels and removable or hinged covers to match exposed surfaces.

8. Finish exterior doors on tops, bottoms, and side edges the same as exterior faces.

9. Finish interior of wall and base cabinets and similar field-finished casework to match exterior.

10. Sand lightly between each succeeding enamel or varnish coat.

B. Scheduling Painting: Apply first coat to surfaces that have been cleaned, pretreated, or otherwise prepared for painting as soon as practicable after preparation and before subsequent surface deterioration.

1. The number of coats and film thickness required are the same regardless of application method. Do not apply succeeding coats until previous coat has cured as recommended by manufacturer. If sanding is required to produce a smooth,
even surface according to manufacturer's written instructions, sand between applications.

2. Omit primer over metal surfaces that have been shop primed and touchup painted.

3. If undercoats, stains, or other conditions show through final coat of paint, apply additional coats until paint film is of uniform finish, color, and appearance. Give special attention to ensure that edges, corners, crevices, welds, and exposed fasteners receive a dry film thickness equivalent to that of flat surfaces.

4. Allow sufficient time between successive coats to permit proper drying. Do not recoat surfaces until paint has dried to where it feels firm, and does not deform or feel sticky under moderate thumb pressure, and until application of another coat of paint does not cause undercoat to lift or lose adhesion.

C. Application Procedures: Apply paints and coatings by brush, roller, spray, or other applicators according to manufacturer's written instructions.

1. Brushes: Use brushes best suited for type of material applied. Use brush of appropriate size for surface or item being painted.

2. Rollers: Use rollers of carpet, velvet-back, or high-pile sheep's wool as recommended by manufacturer for material and texture required.

3. Spray Equipment: Use airless spray equipment with orifice size as recommended by manufacturer for material and texture required.

D. Minimum Coating Thickness: Apply paint materials no thinner than manufacturer's recommended spreading rate to achieve dry film thickness indicated. Provide total dry film thickness of the entire system as recommended by manufacturer.

E. Mechanical and Electrical Work: Painting of mechanical and electrical work is limited to items exposed in equipment rooms and occupied spaces.

F. Mechanical items to be painted include, but are not limited to, the following:

1. Uninsulated metal piping.
2. Uninsulated plastic piping.
3. Pipe hangers and supports.
4. Tanks that do not have factory-applied final finishes.
5. Visible portions of internal surfaces of metal ducts, without liner, behind air inlets and outlets.
6. Duct, equipment, and pipe insulation having "all-service jacket" or other paintable jacket material.
7. Mechanical equipment that is indicated to have a factory-primed finish for field painting.

G. Electrical items to be painted include, but are not limited to, the following:
1. Switchgear.
2. Panelboards.
3. Electrical equipment that is indicated to have a factory-primed finish for field painting.

H. Block Fillers: Apply block fillers to concrete masonry block at a rate to ensure complete coverage with pores filled.

I. Prime Coats: Before applying finish coats, apply a prime coat, as recommended by manufacturer, to material that is required to be painted or finished and that has not been prime coated by others. Reccoat primed and sealed surfaces where evidence of suction spots or unsealed areas in first coat appears, to ensure a finish coat with no bleed-through or other defects due to insufficient application of sealer or primer.

J. Pigmented (Opaque) Finishes: Completely cover surfaces as necessary to provide a smooth, opaque surface of uniform finish, color, appearance, and coverage. Cloudiness, spotting, holidays, laps, brush marks, runs, sags, ropiness, or other surface imperfections will not be acceptable.

K. Transparent (Clear) Finishes: Use multiple coats to produce a glass-smooth surface film of even luster. Provide a finish free of laps, runs, cloudiness, color irregularity, brush marks, orange peel, nail holes, or other surface imperfections.

1. Provide satin finish for final coats.

L. Stipple Enamel Finish: Roll and redistribute paint to an even and fine texture. Leave no evidence of rolling, such as laps, irregularity in texture, skid marks, or other surface imperfections.

M. Completed Work: Match approved samples for color, texture, and coverage. Remove, refinish, or repaint work not complying with requirements.

3.4 FIELD QUALITY CONTROL

A. Owner reserves the right to invoke the following test procedure at any time and as often as Owner deems necessary during the period when paint is being applied:

1. Owner will engage a qualified independent testing agency to sample paint material being used. Samples of material delivered to Project will be taken, identified, sealed, and certified in the presence of Contractor.

2. Testing agency will perform appropriate tests as required by Owner

3. Owner may direct Contractor to stop painting if test results show material being used does not comply with specified requirements. Contractor shall remove noncomplying paint from Project site, pay for testing, and repaint surfaces previously coated with the noncomplying paint. If necessary, Contractor may be required to remove noncomplying paint from previously painted surfaces if, on repainting with specified paint, the 2 coatings are incompatible.

3.5 CLEANING
A. Cleanup: At the end of each workday, remove empty cans, rags, rubbish, and other discarded paint materials from Project site.
   1. After completing painting, clean glass and paint-splattered surfaces. Remove splattered paint by washing and scraping without scratching or damaging adjacent finished surfaces.

B. Remove all spilled, splashed or splattered paint from all surfaces. Leave entire project in a clean condition.

C. Place scrapings, empty cans, consumed brushes, etc. in plastic bags and dispose of in the proper manner by the Contractor. Place used mineral spirits and other hazardous liquids in an appropriate container and is the responsibility of the Contractor to properly dispose of in full compliance of E.P.A. rules and regulations.

D. Do not mar surface finish by cleaning.

E. Leave entire project in a clean condition.

3.6 PROTECTION

A. Protect work of other trades, whether being painted or not, against damage from painting. Correct damage by cleaning, repairing or replacing, and repainting, as approved by Architect.

B. Provide "Wet Paint" signs to protect newly painted finishes. After completing painting operations, remove temporary protective wrappings provided by others to protect their work.
   1. After work of other trades is complete, touch up and restore damaged or defaced painted surfaces. Comply with procedures specified in PDCA P1.

3.7 EXTERIOR PAINT SCHEDULE (provide the following finish systems):

A. Concrete, Stucco, and Brick: Unless specialty finish is noted:
   1. Low-Luster Acrylic Paint:
      (a) Primer: Exterior concrete and masonry primer.
      (b) Finish: 2 coats Exterior low-luster acrylic paint.
   2. Semi-gloss Acrylic-Enamel:
      (a) Primer: Exterior concrete and masonry primer.
      (b) Finish: 2 coats Exterior semi-gloss acrylic enamel.
   3. Low Luster Acrylic Elastomeric:
      (a) Primer/Sealer: Latex masonry sealer
      (b) Finish: 2 coats Low luster Acrylic elastomeric waterproof coating.

B. Concrete Unit Masonry:
   1. Low-Luster Acrylic Paint:
      (a) Block Filler: Concrete unit masonry block filler.
      (b) Finish: 2 coats Exterior low-luster acrylic paint.
2. Semi-gloss Acrylic-Enamel:
   (a) Block Filler: Concrete unit masonry block filler.
   (b) Finish: 2 coats Exterior semi-gloss acrylic enamel.

3. Low Luster Acrylic Elastomeric:
   (a) Primer/Sealer: Alkyd masonry sealer
   (b) Finish: 2 coats Low luster Acrylic elastomeric waterproof coating

C. Ferrous-Metal: Primer is not required on shop-primed items.
   1. Full-Gloss Acrylic-Enamel:
      (a) Primer: Exterior ferrous-metal primer.
      (b) Finish: 2 coats Exterior full-gloss acrylic enamel for ferrous and other metals.
   2. Semi-gloss Acrylic-Enamel:
      (a) Primer: Exterior ferrous-metal primer
      (b) Finish: 2 coats Exterior semi-gloss acrylic enamel for ferrous and other metals.

D. Zinc-Coated Metal:
   1. Full-Gloss Acrylic-Enamel:
      (a) Primer: Exterior galvanized metal primer.
      (b) Finish: 2 coats Exterior full-gloss acrylic enamel for ferrous and other metals.
   2. Semi-gloss Acrylic-Enamel:
      (a) Primer: Exterior ferrous-metal primer
      (b) Finish: 2 coats Exterior semi-gloss acrylic enamel for ferrous and other metals.

E. Aluminum: Provide the following finish systems over exterior aluminum surfaces:
   1. Full-Gloss Acrylic-Enamel Finish:
      (a) Primer: Exterior aluminum primer under acrylic finishes.
      (b) Finish: 2 coats Exterior full-gloss acrylic enamel for ferrous and other metals.
   2. Semi-gloss Acrylic-Enamel Finish:
      (a) Primer: Exterior aluminum primer under acrylic finishes
      (b) Finish: 2 coats Exterior semi-gloss acrylic enamel for ferrous and other metals.

F. Wood:
1. Low-Luster Acrylic Paint:
   
   (a) Primer: Exterior concrete and masonry primer.
   (b) Finish: 2 coats Exterior low-luster acrylic paint.

2. Low Luster Acrylic Elastomeric:
   
   (a) Primer/Sealer: Latex masonry sealer
   (b) Finish: 2 coats Low luster Acrylic elastomeric waterproof coating.

3.8 INTERIOR PAINT SCHEDULE

A. Concrete and Brick:

1. Low-Luster Acrylic-Enamel: (ceilings and soffits).
   
   (a) Primer: Interior concrete and masonry primer.
   (b) Finish: 2 coats Interior low-luster acrylic enamel.

2. Semi-gloss Acrylic-Enamel:
   
   (a) Primer: Interior concrete and masonry primer.
   (b) Finish: 2 coats Interior semi-gloss acrylic enamel.

B. Concrete Unit Masonry:

1. Semi-gloss Acrylic-Enamel:
   
   (a) Block Filler: Concrete unit masonry block filler.
   (b) Finish: 2 coats Interior semi-gloss acrylic enamel.

C. Concrete Unit Masonry, Gypsum Board and Plaster:

1. Semi-gloss Waterborne Acrylic Epoxy:
   
   (a) Primer: Epoxy primer.
   (b) Finish: 2 coats Waterborne semi-gloss Acrylic Epoxy Coating.

D. Gypsum Board:

1. Low-Luster Acrylic-Enamel: (ceilings and soffits).
   
   (a) Primer: Interior gypsum board primer.
   (b) Finish: 2 coats Interior low-luster acrylic enamel.

2. Semi-gloss Acrylic-Enamel Finish:
   
   (a) Primer: Interior gypsum board primer.
   (b) Finish: 2 coats Interior semi-gloss acrylic enamel.

E. Plaster:
1. Low-Luster Acrylic-Enamel: (ceilings and soffits).
   (a) Primer: Interior plaster primer.
   (b) Finish: 2 coats Interior low-luster acrylic enamel.

2. Semi-gloss Acrylic-Enamel Finish:
   (a) Primer: Interior plaster primer.
   (b) Finish: 2 coats Interior semi-gloss acrylic enamel.

F. Acoustical Plaster:
   1. Flat Acrylic-Latex Finish:
      (a) Finish: 2 coats Interior flat acrylic paint.

G. Wood:
   1. Semi-gloss Acrylic-Enamel:
      (a) Primer: Interior wood primer for acrylic-enameled and semi-gloss alkyd-enamel finishes.
      (b) Finish: 2 coats Interior semi-gloss acrylic enamel.

   2. Full-Gloss Acrylic-Enamel:
      (a) Primer: Interior wood primer for acrylic-enameled and semi-gloss alkyd-enamel finishes.
      (b) Finish: 2 coats Interior full-gloss acrylic enamel.

H. Ferrous-Metal:
   1. Full-Gloss Acrylic-Enamel:
      (a) Primer: Interior ferrous-metal primer.
      (b) Finish: 2 coats Interior full-gloss acrylic enamel.

   2. Semi-gloss Acrylic-Enamel:
      (a) Primer: Interior ferrous-metal primer.
      (b) Finish: 2 coats Interior semi-gloss acrylic enamel.

I. Zinc-Coated Metal:
   1. Full-Gloss Acrylic-Enamel:
      (a) Primer: Interior zinc-coated metal primer.
      (b) Finish: 2 coats Interior full-gloss acrylic enamel.

   2. Semi-gloss Acrylic-Enamel:
      (a) Primer: Interior zinc-coated metal primer.
      (b) Finish: 2 coats Interior semi-gloss acrylic enamel.
J. All-Service Jacket over Insulation:

1. Flat Acrylic Finish: Add fungicidal agent to render fabric mildew proof.
   (a) Finish: 2 coats Interior flat latex-emulsion size.

3.9 INTERIOR STAIN AND NATURAL-FINISH WOODWORK SCHEDULE

A. Stained Woodwork:

   (a) Filler: Open-grain wood filler.
   (b) Stain: Interior wood stain.
   (c) Finish: 2 coats Interior waterborne clear satin varnish.

   (a) Filler: Open-grain wood filler.
   (b) Stain: Interior wood stain.
   (c) Finish: 2 coats Interior waterborne clear gloss varnish.

B. Natural-Finish Woodwork:

   (a) Filler: Open-grain wood filler.
   (b) Finish: 2 coats Interior waterborne clear satin varnish.

   (a) Filler: Open-grain wood filler.
   (b) Finish: 2 coats Interior waterborne clear gloss varnish.

END OF SECTION
SECTION 09 91 00
PAINTING

PART 1 GENERAL

1.1 SECTION INCLUDES:

A. Surface preparation.

B. Field application of primers, paints, stains, and other coatings for exterior and interior items and surfaces.

1.2 SYSTEM DESCRIPTION

A. Paint exposed surfaces, except where these Specifications indicate that the surface or material is not to be painted or is to remain natural. If an item or a surface is not specifically mentioned, paint the item or surface the same as similar adjacent materials or surfaces. If a color of finish is not indicated, Architect will select from standard colors and finishes available.

1. Painting includes field painting of exposed bare and covered pipes and ducts (including color coding), hangers, exposed steel and iron supports, and surfaces of mechanical and electrical equipment that do not have a factory-applied final finish.

2. Surface preparation, priming, and finish coats specified in this Section are in addition to shop priming and surface treatment specified in other Sections.

B. Do not paint prefinished items, concealed surfaces, finished metal surfaces, operating parts, and labels.

1. Prefinished items include the following factory-finished components:

   (a) Finished mechanical and electrical equipment.
   (b) Light fixtures.

2. Concealed surfaces include walls or ceilings in the following generally inaccessible spaces:

   (a) NA

3. Finished metal surfaces include the following:

   (a) Anodized aluminum.
   (b) Stainless steel.

4. Operating parts include moving parts of operating equipment and the following:

   (a) NA

5. Labels: Do not paint over UL, FMG, or other code-required labels or equipment name, identification, performance rating, or nomenclature plates.

C. Alternates: Refer to Division 1 Section "Alternates" for description of Work in this Section affected by alternates.
1.3 REFERENCES

A. American Society for Materials and Testing (ASTM).
   3. D4262-pH of Chemically Cleaned or Etched Concrete Surfaces.
   4. D4263-Indicating Moisture in Concrete by the Plastic Sheet Method.

B. Environmental Protection Agency (EPA).

C. Factory Mutual Global (FMG).

D. NACE International the Corrosion Society.


H. Painting and Decorating Contractors Association (PDCA) P4-Responsibility for Inspection and Acceptance of Surfaces Prior to Painting and Decorating.

I. Society of Protective Coatings (SSPC) SP6-Commercial Abrasion Blast.


K. Underwriter’s Laboratory (UL).

1.4 DEFINITIONS

A. General: Standard coating terms defined in ASTM D16 apply to this Section.
   1. Flat: Lusterless or matte finish with a gloss range below 15 when measured at an 85 degree meter.
   2. Eggshell: Low-sheen finish with a gloss range between 20 and 35 when measured at a 60 degree meter.
   3. Semi-gloss: Medium-sheen finish with a gloss range between 35 and 70 when measured at a 60 degree meter.
   4. Full gloss: High-sheen finish with a gloss range more than 70 when measured at a 60 degree meter.

1.5 SUBMITTALS
A. Product Data: For each paint system indicated. Include block fillers and primers.

1. Material List: An inclusive list of required coating materials. Indicate each material and cross-reference specific coating, finish system, and application. Identify each material by manufacturer's catalog number and general classification.

2. Manufacturer's Information: Manufacturer's technical information, including label analysis and instructions for handling, storing, and applying each coating material.

3. Low Emitting Materials:
   (a) Submit manufacturer's Material Safety Data Sheet Indicating VOC limits of all products.
   (b) Submit manufacturer's certification for all architectural paint, coating, and primer products applied to interior walls and ceilings that comply with the Green Seal Certification standard GS-11, Paints First Edition, May 20, 1993.
   (c) Submit manufacturer's certification for all anti-corrosive and anti-rust paint products applied to interior metal ferrous surfaces that comply with the Green Seal Standard GS-03, Second Edition, January 7, 1997.

B. Samples for Verification: For each color and material to be applied, with texture to simulate actual conditions, on representative Samples of the actual substrate.

1. Provide stepped Samples, defining each separate coat, including block fillers and primers. Use representative colors when preparing Samples for review. Resubmit until required sheen, color, and texture are achieved.

2. Provide a list of materials and applications for each coat of each Sample. Label each Sample for location and application.

3. Submit Samples on the following substrates for Architect's review of color and texture only:
   (a) Concrete: 4 inch square samples for each color and finish.
   (b) Concrete Unit Masonry: 4 by 8-inch samples of masonry, with mortar joint in the center, for each finish and color.
   (c) Painted Wood: 8 inch square samples for each color and material on hardboard.
   (d) Stained or Natural Wood: 4 by 8 inch samples of natural or stained-wood finish on representative wood surfaces.
   (e) Ferrous Metal: 3 inch square samples of flat metal and 6-inch long samples of solid metal for each color and finish.

C. Warranty.

1.6 QUALITY ASSURANCE

A. Applicator Qualifications: Paint applicator shall be licensed in the State of Florida or in Leon County and use state or county journeymen. Provide a legible copy of license and, when applicable a journeymen’s certification attesting to qualification requirements.

1. Certifications: Paint applicator shall provide a certification attesting to having worked on projects similar in scope to this project for a minimum of 5 years. Paint
applicator not providing such documentation or not having the required experience will be removed from the project and replaced by the Contractor.

B. Source Limitations: Obtain block fillers and primers for each coating system from the same manufacturer as the finish coats.

C. Benchmark Samples (Mockups): Provide a full-coat benchmark finish sample for each type of coating and substrate required. Comply with procedures specified in PDCA P5. Duplicate finish of approved sample Submittals.
   1. Architect will select one room or surface to represent surfaces and conditions for application of each type of coating and substrate.
      (a) Wall Surfaces: Provide samples on at least 100 sq. ft.
      (b) Small Areas and Items: Architect will designate items or areas required.
   2. Apply benchmark samples, according to requirements for the completed Work, after permanent lighting and other environmental services have been activated. Provide required sheen, color, and texture on each surface.
      (a) After finishes are accepted, Architect will use the room or surface to evaluate coating systems of a similar nature.

D. Final approval of colors will be from benchmark samples.

E. Conform to ASTM for interpretation of terms used in this Section.

F. Labels: Do not paint over Underwriter's Laboratories (UL), Factory Mutual (FM) or other code required labels or equipment name, identification, performance rating, or nomenclature plates.

G. Regulatory Requirements: Conform to applicable code for flame/fuel/smoke rating requirements for finishes.

H. Single Source Responsibility: Provide primers, paints, stains and other coatings for exterior and interior items and surfaces by the same manufacturer.

1.7 DELIVERY, STORAGE, AND HANDLING

A. Deliver materials to Project site in manufacturer's original, unopened packages and containers bearing manufacturer's name and label and the following information:
   1. Product name or title of material.
   2. Product description (generic classification or binder type).
   3. Manufacturer's stock number and date of manufacture.
   4. Contents by volume, for pigment and vehicle constituents.
   5. Thinning instructions.
   6. Application instructions.
7. Color name and number.

8. VOC content.

B. Store materials not in use in tightly covered containers in a well-ventilated area at a minimum ambient temperature of 45 degrees F and a maximum temperature of 90 degrees F. Maintain storage containers in a clean condition, free of foreign materials and residue.

1. Keep storage area neat and orderly. Remove oily rags and waste daily.

C. Container Labeling: Include manufacturer’s name, type of paint, brand name, brand code, coverage, surface preparation, drying time, cleanup, color designation, and instructions for mixing.

D. Store and mix materials in 1 area only.

E. Comply with health and fire regulations. Take precautionary measures to prevent fire hazards and spontaneous combustion.

1.8 PROJECT CONDITIONS

A. Allow sufficient time for stucco and plaster to moist cure in accordance with Section 09220-Portland Cement Plaster (Stucco). The pH factor and moisture level of all areas to receive primer or paint shall be tested and confirmed.

1. pH factor shall be below 10.
2. Moisture content shall be below 80.
3. Provide a written record of each such test.
4. “Hot” primer shall not be permitted until the pH is below 10.

B. Comply with manufacturer’s recommendations as to environmental conditions under which coatings and coating systems can be applied.

C. Do not do any painting if the relative humidity exceeds 90 percent.

D. Do not apply finish in areas where dust is being generated.

E. Cover or otherwise protect finished work of other trades and surfaces not being painted concurrently or not to be painted.

F. Do not apply paint in snow, rain, fog, or mist; or when relative humidity exceeds 85 percent; or at temperatures less than 5 degrees F above the dew point; or to damp or wet surfaces.

1. Painting may continue during inclement weather if surfaces and areas to be painted are enclosed and heated within temperature limits specified by manufacturer during application and drying periods.

G. Provide continuous ventilation to maintain surface and ambient temperatures 24 hours before, during and 48 hours after painting.

H. Provide lighting levels of 50 foot candles at mid-height at substrate surface.

1.9 WARRANTY
A. Provide a written guarantee, co-signed jointly and severally by the Contractor, painting subcontractor, and materials manufacturers, against cracking, peeling flaking, chalking and mildew on interior surfaces, and additionally against erosion and unreasonable fading or exterior surfaces, for 6 years; agreeing to repair and repaint surfaces affected by such defects, at no cost to the Owner, including necessary removal or protection of other work, without limit, within 30 days after notification by the Owner, and to perform such work based on the provisions of this section, including extension of the guarantee to cover new work.

1.10 EXTRA STOCK

A. Provide “Home Store” data (where painter purchased the paints used on the project) include all paint records and the following Home Store information:

1. Name.
2. Address.
3. Telephone number.
4. Store manager name.
5. List of paints purchased by name and type.

B. Provide a 1 gallon container of each color and surface texture of respective finish paints used on the project.

C. Label each container with color, texture and room locations, in addition to the manufacturer’s label.

D. Deliver and store extra stock at the time of substantial completion.

PART 2 PRODUCTS

2.1 MANUFACTURERS

A. Subject to compliance with the specified requirements, provide products by one of the following manufacturers:

1. Benjamin Moore & Co.
2. Coronado Paint Co.
3. Duron, Inc.
4. ICI Paint Stores, Inc.
5. MAB Paints.
6. PPG Architectural Finishes, Inc.
7. (Basis of Design) Sherwin-Williams Company.

2.2 PAINT MATERIALS, GENERAL
A. Material Compatibility: Provide block fillers, primers, and finish-coat materials that are compatible with one another and with the substrates indicated under conditions of service and application, as demonstrated by manufacturer based on testing and field experience.

B. Material Quality: Provide manufacturer's best-quality paint material of the various coating types specified that are factory formulated and recommended by manufacturer for application indicated. Paint-material containers not displaying manufacturer's product identification will not be acceptable.

1. Proprietary Names: Use of manufacturer's proprietary product names to designate colors or materials is not intended to imply that products named are required to be used to the exclusion of equivalent products of other manufacturers.

C. Colors: As selected by Architect from manufacturer's full range.

D. Millage noted below is minimum acceptable dry film thickness per coat application.

E. Toxicity/IEQ: All interior paint and coating products are to comply with any of the following which apply:

1. All architectural paints, coatings, and primers applied to interior walls and ceilings are to comply with the Green Seal Standard GS-11, First Edition, May 20, 1993.


2.3 VOC CONTENT

A. Products are specified must not exceed the following:

1. Interior Coatings (weight in grams/liter of product):
   (a) Non-Flat: 150.
   (b) Flat: 50.

2. Exterior Coatings weight in grams/liter of product minus water):
   (a) Non-Flat: 200.
   (b) Flat: 100.

2.4 CONCRETE UNIT MASONRY BLOCK FILLERS

A. Concrete Unit Masonry Block Filler: Factory-formulated high-performance latex block fillers.

1. Sherwin-Williams; PrepRite Block Filler (B25W25): Applied at a dry film thickness of not less than 8 mils per coat.
   (a) Meets GS-11.
   (b) Meets FSPMA MP-33.1 Block Filler, Latex-Base, Interior-Exterior Flat, White.

2.5 EXTERIOR PRIMERS
A. Exterior Concrete and Masonry Primer-New Construction: Factory-formulated alkali-resistant acrylic-latex primer for exterior application.
   1. Sherwin-Williams; Loxon Acrylic Primer (A24W300): Applied at a dry film thickness of not less than 3.2 mils per coat.

B. Exterior Concrete and Masonry Primer-for Elastomeric Coatings: Factory-formulated alkali-resistant acrylic-latex primer for exterior application
   1. Sherwin-Williams; Loxon Acrylic Primer (A24W300): Applied at a dry film thickness of not less than 3.2 mils per coat.

C. Exterior Concrete and Masonry Primer-for Existing Construction: Factory-formulated alkali-resistant Acrylic primer for exterior application
   1. Sherwin-Williams; Loxon Conditioner (A24W100): Applied at a spread rate of 200-300 square feet per gallon.

D. Exterior Wood Primer for Acrylic Enamels: Factory-formulated alkyd or latex wood primer for exterior application.
   1. Sherwin-Williams; A-100 Exterior Oil Stain Blocking Primer (Y24W20): Applied at a dry film thickness of not less than 2.3 mils per coat.
   or
   2. Sherwin-Williams; A-100 Exterior Latex Primer (B42W41/B42W43): Applied at a dry film thickness of not less than 1.4 mils per coat.

   1. Sherwin-Williams; Pro-Cryl Universal Primer (B66-310 Series): Applied at a dry film thickness of not less than 2.0 mils per coat (acrylic-based).
      (a) Meets GS-11.
      (b) Meets FSPMA MP-26.3 “Recommended Primer” under Sherwin-Williams DTM Acrylic Gloss Coating (B66 Series).

F. Exterior Zinc-Coated Metal Primer: Factory-formulated galvanized metal primer for exterior application.
   1. Sherwin-Williams; Pro-Cryl Universal Primer (B66-310 Series): Applied at a dry film thickness of not less than 2.0 mils per coat.
      (a) Meets GS-11.
      (b) Meets FSPMA MP-26.3 “Recommended Primer” under Sherwin-Williams DTM Acrylic Gloss Coating (B66 Series).

   1. Sherwin-Williams; Pro-Cryl Universal Primer (B66-310 Series): Applied at a dry film thickness of not less than 2.0 mils per coat.
      (a) Meets GS-11.
2.6 INTERIOR PRIMERS

A. Interior Concrete, Masonry, and Brick Primer: Factory-formulated alkali-resistant acrylic-latex interior primer for interior application.

1. Sherwin-Williams; ProGreen 200 Low VOC Interior Latex Primer (B28W600): Applied at a dry film thickness of not less than 1.5 mils per coat.

(a) Meets GS-11.

B. Interior Gypsum Board Primer: Factory-formulated latex-based primer for interior application.

1. Sherwin-Williams; ProGreen 200 Low VOC Interior Latex Primer (B28W600): Applied at a dry film thickness of not less than 1.5 mils per coat.

(a) Meets GS-11.

C. Interior Plaster Primer: Factory-formulated latex-based primer for interior application.

1. Sherwin-Williams; ProGreen 200 Low VOC Interior Latex Primer (B28W600): Applied at a dry film thickness of not less than 1.5 mils per coat.

(a) Meets GS-11.

D. Interior Wood Primer for Acrylic-Enamel: Factory-formulated acrylic-latex-based interior wood primer.

1. Sherwin-Williams; Harmony Interior Latex Primer (B11W900): Applied at a dry film thickness of not less than 1.3 mils per coat.

(a) Meets GS-11.

or

2. S-W PrepRite ProBlock Latex Primer, B51 Series (4 mils wet, 1.4 mils dry).


1. Sherwin-Williams; ProCryl Universal Primer (B66-310 Series): Applied at a dry film thickness of not less than 2.0 mils per coat.

F. Interior Zinc-Coated Metal Primer: Factory-formulated galvanized metal primer.

1. Sherwin-Williams; ProCryl Universal Primer (B66-310 Series): Applied at a dry film thickness of not less than 2.0 mils per coat.

(a) Meets GS-11.

G. Interior Unit Masonry, Gypsum Board and Plaster: Factory-formulated primer for Epoxy finish.
1. Sherwin-Williams; ProGreen 200 Low VOC Interior Latex Primer (B28W600): Applied at a dry film thickness of not less than 1.5 mils per coat.  
   (a) Meets GS-11.

2.7 EXTERIOR FINISH COATS

A. Exterior Low-Luster Acrylic Elastomeric: Factory-formulated low sheen 100% Acrylic Elastomeric coating for exterior application.  Note: Use elastomers only after receiving approval in writing from the Owner.
   1. Sherwin-Williams; SherLastic Elastomeric Coating (A5-100 Series): Applied at a dry film thickness of not less than 6.0 mils per coat.

   1. Sherwin-Williams; A-100 Exterior Latex Satin (A8 2 Series): Applied at a dry film thickness of not less than 1.3 mils per coat.

C. Exterior Semigloss Acrylic Enamel: Factory-formulated semigloss waterborne acrylic-latex enamel for exterior application.
   1. Sherwin-Williams; DTM Acrylic Coating (B66-200 Series–Semi-Gloss) Applied at a dry film thickness of not less than 2.5 mils per coat.
   (a) Meets GS-11.
   (b) Meets FSPMA MP-26.3 Acrylic-Base Gloss Enamel, Metal Surfaces, Whites and Tints.

   1. Sherwin-Williams; DTM Acrylic Coating (B66-100 Series-Gloss): Applied at a dry film thickness of not less than 2.5 mils per coat.

2.8 INTERIOR FINISH COATS

A. Interior Flat Acrylic Paint: Factory-formulated flat acrylic-emulsion latex paint for interior application.
   1. Sherwin-Williams; ProGreen 200 Low VOC Interior Latex Flat (B30-600 Series): Applied at a dry film thickness of not less than 1.3 mils per coat.
   (a) Meets GS-11.

B. Interior Flat Latex-Emulsion Size: Factory-formulated flat latex-based interior paint.
   1. Sherwin-Williams; Harmony Interior Latex Flat (B5 Series): Applied at a dry film thickness of not less than 1.7 mils per coat.
   (a) Meets GS-11.

C. Interior Low Luster Latex Paint: Factory-formulated eggshell latex based interior paint.
1. Sherwin-Williams; Harmony Interior Latex Eg-Shel (B9 Series): Applied at a dry film thickness of not less than 1.6 mils per coat.
   (a) Meets GS-11.

D. Interior Low-Luster Acrylic Enamel:

   1. Sherwin-Williams; ProGreen 200 Low VOC Interior Latex Eg-Shel (B20-600 Series): Applied at a dry film thickness of not less than 1.7 mils per coat.
      (a) Meets GS-11.


   1. Sherwin-Williams; ProGreen 200 Interior Latex Semi-Gloss (B31-600 Series): Applied at a dry film thickness not less than 1.6 mils per coat.
      (a) Meets GS-11.

F. Interior Full-Gloss Acrylic Enamel:

   1. Sherwin-Williams; Pro Industrial Zero VOC Acrylic Gloss (B66W600): Applied at a dry film thickness of not less than 2.5 mils per coat.


   1. Sherwin-Williams; Water-Based Catalyzed Epoxy (Two Component) (B70W211/B60V15): Applied at a dry film thickness of not less than 2.5 mils per coat.

   2. S-W Pro Industrial Pre-Catalyzed Waterbased Epoxy, K46W150 Series.
      (a) Meets GS-11.


2.9 INTERIOR WOOD STAINS AND VARNISHES

A. Open-Grain Wood Filler: Factory-formulated paste wood filler applied at spreading rate recommended by manufacturer.

   1. Sherwin-Williams; Sher-Wood Natural Filler (D70T1).

B. Interior Wood Stain: Factory-formulated alkyd-based penetrating wood stain for interior application applied at spreading rate recommended by manufacturer.

   1. S-W Minwax 250 VOC Wood Stain

C. Interior Waterborne Clear Satin Varnish: Factory-formulated clear satin acrylic-based polyurethane varnish applied at spreading rate recommended by manufacturer.
1. 2 Coats-Sherwin-Williams; Wood Classics Waterborne Polyurethane Varnish-Satin (A68 Series): Applied at a dry film thickness of not less than 0.8 mils per coat.

D. Interior Waterborne Stain Full-Gloss Varnish:

1. 2 Coats-Sherwin-Williams; Wood Classics Waterborne Polyurethane Varnish-Gloss (A68 Series): Applied at a dry film thickness of not less than 0.8 mils per coat.

PART 3 EXECUTION

3.1 EXAMINATION

A. Examine substrates, areas, and conditions, with applicator present, for compliance with requirements for paint application. Comply with procedures specified in PDCA P4.

1. Proceed with paint application only after unsatisfactory conditions have been corrected and surfaces receiving paint are thoroughly dry.

2. Start of painting will be construed as Applicator's acceptance of surfaces and conditions within a particular area.

B. Coordination of Work: Review other Sections in which primers are provided to ensure compatibility of the total system for various substrates. On request, furnish information on characteristics of finish materials to ensure use of compatible primers.

3.2 PREPARATION

A. General: Remove hardware and hardware accessories, plates, machined surfaces, lighting fixtures, and similar items already installed that are not to be painted. If removal is impractical or impossible because of size or weight of the item, provide surface-applied protection before surface preparation and painting.

1. After completing painting operations in each space or area, reinstall items removed using workers skilled in the trades involved.

B. Cleaning: Before applying paint or other surface treatments, clean substrates of substances that could impair bond of the various coatings. Remove oil and grease before cleaning.

1. Schedule cleaning and painting so dust and other contaminants from the cleaning process will not fall on wet, newly painted surfaces.

C. Surface Preparation: Clean and prepare surfaces to be painted according to manufacturer's written instructions for each particular substrate condition and as specified.

1. Provide pull tests on existing painted surfaces where a different coating will be applied. Verify with the manufacturer that the coatings are compatible.

2. Provide barrier coats over incompatible primers or remove and reprime.

3. Cementitious Materials: Prepare concrete, concrete unit masonry, cement plaster, and mineral-fiber-reinforced cement panel surfaces to be painted. Remove efflorescence, chalk, dust, dirt, grease, oils, and release agents. Roughen as required to remove glaze. If hardeners or sealers have been used to improve curing, use mechanical methods of surface preparation.
(a) Use abrasive blast-cleaning methods if recommended by paint manufacturer.
(b) Determine alkalinity pH and moisture content of surfaces by performing appropriate tests. If surfaces are sufficiently alkaline to cause the finish paint to blister and burn, correct this condition by approved curing methods in Section 09220-Portland Cement (Stucco). Do not paint surfaces if moisture content exceeds that permitted in manufacturer's written instructions.
(c) Clean concrete floors to be painted with a 5 percent solution of muriatic acid or other etching cleaner. Flush the floor with clean water to remove acid, neutralize with ammonia, rinse, allow to dry, and vacuum before painting.

4. Wood: Clean surfaces of dirt, oil, and other foreign substances with scrapers, mineral spirits, and sandpaper, as required. Sand surfaces exposed to view smooth and dust off.
   (a) Scrape and clean small, dry, seasoned knots, and apply a thin coat of white shellac or other recommended knot sealer before applying primer. After priming, fill holes and imperfections in finish surfaces with putty or plastic wood filler. Sand smooth when dried.
   (b) Prime, stain, or seal wood to be painted immediately on delivery. Prime edges, ends, faces, undersides, and back sides of wood, including cabinets, counters, cases, and paneling.
   (c) If transparent finish is required, backprime with non-yellowing varnish.
   (d) Backprime paneling on interior partitions where masonry, plaster, or other wet wall construction occurs on backside.
   (e) Seal tops, bottoms, and cutouts of unprimed wood doors with a heavy coat of varnish or sealer immediately on delivery.

5. Ferrous Metals: Clean ungalvanized ferrous-metal surfaces that have not been shop coated; remove oil, grease, dirt, loose mill scale, and other foreign substances. Use solvent or mechanical cleaning methods that comply with the Steel Structures Painting Counsel's recommendations.
   (a) Blast steel surfaces clean as recommended by paint system manufacturer and according to SSPC-SP 6/NACE No. 3.
   (b) Treat bare and sandblasted or pickled clean metal with a metal treatment wash coat before priming.
   (c) Touch up bare areas and shop-applied prime coats that have been damaged. Wire-brush, clean with solvents recommended by paint manufacturer, and touch up with same primer as the shop coat.

6. Galvanized Surfaces: Clean galvanized surfaces with nonpetroleum-based solvents so surface is free of oil and surface contaminants. Remove pretreatment or "passivators" from galvanized sheet metal fabricated from coil stock by mechanical methods SSPC-SP 7.

D. Material Preparation: Mix and prepare paint materials according to manufacturer's written instructions.
   1. Maintain containers used in mixing and applying paint in a clean condition, free of foreign materials and residue.
2. Stir material before application to produce a mixture of uniform density. Stir as required during application. Do not stir surface film into material. If necessary, remove surface film and strain material before using.

3. Use only thinners approved by paint manufacturer and only within recommended limits.

E. Tinting: Tint each undercoat a lighter shade to simplify identification of each coat when multiple coats of same material are applied. Tint undercoats to match the color of the finish coat, but provide sufficient differences in shade of undercoats to distinguish each separate coat.

3.3 APPLICATION

A. General: Apply paint according to manufacturer’s written instructions. Use applicators and techniques best suited for substrate and type of material being applied.

1. Paint colors, surface treatments, and finishes are indicated in the paint schedules.

2. Do not paint over dirt, rust, scale, grease, moisture, scuffed surfaces, or conditions detrimental to formation of a durable paint film.

3. Provide finish coats that are compatible with primers used.

4. The term "exposed surfaces" includes areas visible when permanent or built-in fixtures, grilles, convector covers, covers for finned-tube radiation, and similar components are in place. Extend coatings in these areas, as required, to maintain system integrity and provide desired protection.

5. Paint surfaces behind movable equipment and furniture the same as similar exposed surfaces. Paint surfaces behind permanently fixed equipment and furniture with prime coat only.

6. Paint interior surfaces of ducts with a flat, nonspecular black paint where visible through registers or grilles.

7. Paint back sides of access panels and removable or hinged covers to match exposed surfaces.

8. Finish exterior doors on tops, bottoms, and side edges the same as exterior faces.

9. Finish interior of wall and base cabinets and similar field-finished casework to match exterior.

10. Sand lightly between each succeeding enamel or varnish coat.

B. Scheduling Painting: Apply first coat to surfaces that have been cleaned, pretreated, or otherwise prepared for painting as soon as practicable after preparation and before subsequent surface deterioration.

1. The number of coats and film thickness required are the same regardless of application method. Do not apply succeeding coats until previous coat has cured as recommended by manufacturer. If sanding is required to produce a smooth,
even surface according to manufacturer's written instructions, sand between applications.

2. Omit primer over metal surfaces that have been shop primed and touchup painted.

3. If undercoats, stains, or other conditions show through final coat of paint, apply additional coats until paint film is of uniform finish, color, and appearance. Give special attention to ensure that edges, corners, crevices, welds, and exposed fasteners receive a dry film thickness equivalent to that of flat surfaces.

4. Allow sufficient time between successive coats to permit proper drying. Do not recoat surfaces until paint has dried to where it feels firm, and does not deform or feel sticky under moderate thumb pressure, and until application of another coat of paint does not cause undercoat to lift or lose adhesion.

C. Application Procedures: Apply paints and coatings by brush, roller, spray, or other applicators according to manufacturer's written instructions.

1. Brushes: Use brushes best suited for type of material applied. Use brush of appropriate size for surface or item being painted.

2. Rollers: Use rollers of carpet, velvet-back, or high-pile sheep's wool as recommended by manufacturer for material and texture required.

3. Spray Equipment: Use airless spray equipment with orifice size as recommended by manufacturer for material and texture required.

D. Minimum Coating Thickness: Apply paint materials no thinner than manufacturer's recommended spreading rate to achieve dry film thickness indicated. Provide total dry film thickness of the entire system as recommended by manufacturer.

E. Mechanical and Electrical Work: Painting of mechanical and electrical work is limited to items exposed in equipment rooms and occupied spaces.

F. Mechanical items to be painted include, but are not limited to, the following:

1. Uninsulated metal piping.

2. Uninsulated plastic piping.

3. Pipe hangers and supports.

4. Tanks that do not have factory-applied final finishes.

5. Visible portions of internal surfaces of metal ducts, without liner, behind air inlets and outlets.

6. Duct, equipment, and pipe insulation having "all-service jacket" or other paintable jacket material.

7. Mechanical equipment that is indicated to have a factory-primed finish for field painting.

G. Electrical items to be painted include, but are not limited to, the following:
1. Switchgear.

2. Panelboards.

3. Electrical equipment that is indicated to have a factory-primed finish for field painting.

H. Block Fillers: Apply block fillers to concrete masonry block at a rate to ensure complete coverage with pores filled.

I. Prime Coats: Before applying finish coats, apply a prime coat, as recommended by manufacturer, to material that is required to be painted or finished and that has not been prime coated by others. Recoat primed and sealed surfaces where evidence of suction spots or unsealed areas in first coat appears, to ensure a finish coat with no bleed-through or other defects due to insufficient application of sealer or primer.

J. Pigmented (Opaque) Finishes: Completely cover surfaces as necessary to provide a smooth, opaque surface of uniform finish, color, appearance, and coverage. Cloudiness, spotting, holidays, laps, brush marks, runs, sags, ropiness, or other surface imperfections will not be acceptable.

K. Transparent (Clear) Finishes: Use multiple coats to produce a glass-smooth surface film of even luster. Provide a finish free of laps, runs, cloudiness, color irregularity, brush marks, orange peel, nail holes, or other surface imperfections.

1. Provide satin finish for final coats.

L. Stipple Enamel Finish: Roll and redistribute paint to an even and fine texture. Leave no evidence of rolling, such as laps, irregularity in texture, skid marks, or other surface imperfections.

M. Completed Work: Match approved samples for color, texture, and coverage. Remove, refinish, or repaint work not complying with requirements.

3.4 FIELD QUALITY CONTROL

A. Owner reserves the right to invoke the following test procedure at any time and as often as Owner deems necessary during the period when paint is being applied:

1. Owner will engage a qualified independent testing agency to sample paint material being used. Samples of material delivered to Project will be taken, identified, sealed, and certified in the presence of Contractor.

2. Testing agency will perform appropriate tests as required by Owner

3. Owner may direct Contractor to stop painting if test results show material being used does not comply with specified requirements. Contractor shall remove noncomplying paint from Project site, pay for testing, and repaint surfaces previously coated with the noncomplying paint. If necessary, Contractor may be required to remove noncomplying paint from previously painted surfaces if, on repainting with specified paint, the 2 coatings are incompatible.

3.5 CLEANING
A. Cleanup: At the end of each workday, remove empty cans, rags, rubbish, and other discarded paint materials from Project site.

   1. After completing painting, clean glass and paint-splattered surfaces. Remove splattered paint by washing and scraping without scratching or damaging adjacent finished surfaces.

B. Remove all spilled, splashed or splattered paint from all surfaces. Leave entire project in a clean condition.

C. Place scrapings, empty cans, consumed brushes, etc. in plastic bags and dispose of in the proper manner by the Contractor. Place used mineral spirits and other hazardous liquids in an appropriate container and is the responsibility of the Contractor to properly dispose of in full compliance of E.P.A. rules and regulations.

D. Do not mar surface finish by cleaning.

E. Leave entire project in a clean condition.

3.6 PROTECTION

A. Protect work of other trades, whether being painted or not, against damage from painting. Correct damage by cleaning, repairing or replacing, and repainting, as approved by Architect.

B. Provide "Wet Paint" signs to protect newly painted finishes. After completing painting operations, remove temporary protective wrappings provided by others to protect their work.

   1. After work of other trades is complete, touch up and restore damaged or defaced painted surfaces. Comply with procedures specified in PDCA P1.

3.7 EXTERIOR PAINT SCHEDULE (provide the following finish systems):

A. Concrete, Stucco, and Brick: Unless specialty finish is noted:

   1. Low-Luster Acrylic Paint:
      (a) Primer: Exterior concrete and masonry primer.
      (b) Finish: 2 coats Exterior low-luster acrylic paint.

   2. Semi-gloss Acrylic-Enamel:
      (a) Primer: Exterior concrete and masonry primer.
      (b) Finish: 2 coats Exterior semi-gloss acrylic enamel.

   3. Low Luster Acrylic Elastomeric:
      (a) Primer/Sealer: Latex masonry sealer
      (b) Finish: 2 coats Low luster Acrylic elastomeric waterproof coating.

B. Concrete Unit Masonry:

   1. Low-Luster Acrylic Paint:
      (a) Block Filler: Concrete unit masonry block filler.
      (b) Finish: 2 coats Exterior low-luster acrylic paint.
2. Semi-gloss Acrylic-Enamel:
   (a) Block Filler: Concrete unit masonry block filler.
   (b) Finish: 2 coats Exterior semi-gloss acrylic enamel.

3. Low Luster Acrylic Elastomeric:
   (a) Primer/Sealer: Alkyd masonry sealer
   (b) Finish: 2 coats Low luster Acrylic elastomeric waterproof coating

C. Ferrous-Metal: Primer is not required on shop-primed items.
   1. Full-Gloss Acrylic-Enamel:
      (a) Primer: Exterior ferrous-metal primer.
      (b) Finish: 2 coats Exterior full-gloss acrylic enamel for ferrous and other metals.
   2. Semi-gloss Acrylic-Enamel:
      (a) Primer: Exterior ferrous-metal primer
      (b) Finish: 2 coats Exterior semi-gloss acrylic enamel for ferrous and other metals.

D. Zinc-Coated Metal:
   1. Full-Gloss Acrylic-Enamel:
      (a) Primer: Exterior galvanized metal primer.
      (b) Finish: 2 coats Exterior full-gloss acrylic enamel for ferrous and other metals.
   2. Semi-gloss Acrylic-Enamel:
      (a) Primer: Exterior ferrous-metal primer
      (b) Finish: 2 coats Exterior semi-gloss acrylic enamel for ferrous and other metals.

E. Aluminum: Provide the following finish systems over exterior aluminum surfaces:
   1. Full-Gloss Acrylic-Enamel Finish:
      (a) Primer: Exterior aluminum primer under acrylic finishes.
      (b) Finish: 2 coats Exterior full-gloss acrylic enamel for ferrous and other metals.
   2. Semi-gloss Acrylic-Enamel Finish:
      (a) Primer: Exterior aluminum primer under acrylic finishes
      (b) Finish: 2 coats Exterior semi-gloss acrylic enamel for ferrous and other metals.

F. Wood:
1. Low-Luster Acrylic Paint:
   (a) Primer: Exterior concrete and masonry primer.
   (b) Finish: 2 coats Exterior low-luster acrylic paint.

2. Low Luster Acrylic Elastomeric:
   (a) Primer/Sealer: Latex masonry sealer
   (b) Finish: 2 coats Low luster Acrylic elastomeric waterproof coating.

3.8 INTERIOR PAINT SCHEDULE

A. Concrete and Brick:
   1. Low-Luster Acrylic-Enamel: (ceilings and soffits).
      (a) Primer: Interior concrete and masonry primer.
      (b) Finish: 2 coats Interior low-luster acrylic enamel.
   2. Semi-gloss Acrylic-Enamel:
      (a) Primer: Interior concrete and masonry primer.
      (b) Finish: 2 coats Interior semi-gloss acrylic enamel.

B. Concrete Unit Masonry:
   1. Semi-gloss Acrylic-Enamel:
      (a) Block Filler: Concrete unit masonry block filler.
      (b) Finish: 2 coats Interior semi-gloss acrylic enamel.

C. Concrete Unit Masonry, Gypsum Board and Plaster:
   1. Semi-gloss Waterborne Acrylic Epoxy:
      (a) Primer: Epoxy primer.
      (b) Finish: 2 coats Waterborne semi-gloss Acrylic Epoxy Coating.

D. Gypsum Board:
   1. Low-Luster Acrylic-Enamel: (ceilings and soffits).
      (a) Primer: Interior gypsum board primer.
      (b) Finish: 2 coats Interior low-luster acrylic enamel.
   2. Semi-gloss Acrylic-Enamel Finish:
      (a) Primer: Interior gypsum board primer.
      (b) Finish: 2 coats Interior semi-gloss acrylic enamel.

E. Plaster:
1. Low-Luster Acrylic-Enamel: (ceilings and soffits).
   (a) Primer: Interior plaster primer.
   (b) Finish: 2 coats Interior low-luster acrylic enamel.

2. Semi-gloss Acrylic-Enamel Finish:
   (a) Primer: Interior plaster primer.
   (b) Finish: 2 coats Interior semi-gloss acrylic enamel.

F. Acoustical Plaster:
   1. Flat Acrylic-Latex Finish:
      (a) Finish: 2 coats Interior flat acrylic paint.

G. Wood:
   1. Semi-gloss Acrylic-Enamel:
      (a) Primer: Interior wood primer for acrylic-enameled and semi-gloss alkyd-enamel finishes.
      (b) Finish: 2 coats Interior semi-gloss acrylic enamel.

   2. Full-Gloss Acrylic-Enamel:
      (a) Primer: Interior wood primer for acrylic-enameled and semi-gloss alkyd-enamel finishes.
      (b) Finish: 2 coats Interior full-gloss acrylic enamel.

H. Ferrous-Metal:
   1. Full-Gloss Acrylic-Enamel:
      (a) Primer: Interior ferrous-metal primer.
      (b) Finish: 2 coats Interior full-gloss acrylic enamel.

   2. Semi-gloss Acrylic-Enamel:
      (a) Primer: Interior ferrous-metal primer.
      (b) Finish: 2 coats Interior semi-gloss acrylic enamel.

I. Zinc-Coated Metal:
   1. Full-Gloss Acrylic-Enamel:
      (a) Primer: Interior zinc-coated metal primer.
      (b) Finish: 2 coats Interior full-gloss acrylic enamel.

   2. Semi-gloss Acrylic-Enamel:
      (a) Primer: Interior zinc-coated metal primer.
      (b) Finish: 2 coats Interior semi-gloss acrylic enamel.
J. **All-Service Jacket over Insulation:**

1. **Flat Acrylic Finish:** Add fungicidal agent to render fabric mildew proof.
   
   (a) **Finish:** 2 coats Interior flat latex-emulsion size.

3.9 **INTERIOR STAIN AND NATURAL-FINISH WOODWORK SCHEDULE**

A. **Stained Woodwork:**

1. **Waterborne Clear Satin-Varnish:** Wipe wood filler before applying stain.

   (a) **Filler:** Open-grain wood filler.
   (b) **Stain:** Interior wood stain.
   (c) **Finish:** 2 coats Interior waterborne clear satin varnish.

2. **Waterborne Stain Full-Gloss Varnish Finish:** Wipe filler before applying stain.

   (a) **Filler:** Open-grain wood filler.
   (b) **Stain:** Interior wood stain.
   (c) **Finish:** 2 coats Interior waterborne clear gloss varnish.

B. **Natural-Finish Woodwork:**

1. **Waterborne Clear Satin-Varnish:** Wipe wood filler before applying stain.

   (a) **Filler:** Open-grain wood filler.
   (b) **Finish:** 2 coats Interior waterborne clear satin varnish.

2. **Waterborne Full-Gloss Varnish:** Wipe filler before applying stain.

   (a) **Filler:** Open-grain wood filler.
   (b) **Finish:** 2 coats Interior waterborne clear gloss varnish.

END OF SECTION