EXPRESSIVE ARCHITECTURE

Creative. Functional. Solutions.

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HISTORIC EXTERIOR RESTORATION + ENTRANCE IMPROVEMENTS TO:

WALES TOWNSHIP HALL

1372 Wales Center Road,
Goodells, Michigan
eA Project # 22.022

June 2, 2023

SPECIFICATION AND INSTRUCTION MANUAL

Sealed Proposals will be received for the HISTORIC EXTERIOR RESTORATION & ENTRANCE IMPROVEMENTS TO WALES TOWNSHIP HALL, located at 1372 Wales Center Rd, Goodells, MI 48027

Bids are to be addressed to Elizabeth (Liz) Masters, Supervisor and will be received until 3:30pm Tuesday July 11th, 2023, at the Township Hall

WALES TOWNSHIP HALL
1372 Wales Center Rd,
Goodells, MI 48027

Qualified bidders are invited to submit bids

A single combined proposal will be received for the work of all trades.

Pre-Bid Meeting/Tour:

Date / Time: Friday June 16th, 2023, 10:00 am – 12:30 pm
Location: On site, 1372 Wales Center Rd, Goodells, MI 48027
Contact: Liz Masters, Supervisor
Attendance: Mandatory (unless a later individual tour date is approved by Liz Masters)

Digital copies of the bid documents will be available for free download from: http://walestownship.org

Bid documents will be available for purchase from: Sir Speedy Printing 600 Huron Ave Port Huron, MI 48060, 810.982.8202 sirspeedyph@outlook.com

The bid documents, including plans and specifications, are on file at the following locations:

PROJECT LOCATION
WALES TOWNSHIP HALL
1372 Wales Center Rd
Goodells, MI 48027
810.543.3058
Contact: Liz Masters, Supervisor

ARCHITECT'S OFFICE
EXPRESSIVE ARCHITECTURE, LLC
18620 W 10 Mile Road, Suite 220
Southfield, MI 48075
248.936.0026
Jeremy Griffis, RA, NCARB

PROJECT: **WALES TOWNSHIP HALL**
GOODELLS, MI

ARCHITECT: **EXPRESSIVE ARCHITECTURE**
18620 W 10 Mile Road Suite 220
Southfield, Mi 48075
248.936.0026

2827 Gratiot Blvd, #2
Marysville, Mi 48040

Contact: Jeremy Griffis Jgriffis@expressivearchitecture.com

CLIENT: **WALES TOWNSHIP HALL**
Elizabeth (Liz) Masters, Township Supervisor
1372 Wales Center Rd, Goodells, MI 48027
P: 810-543-3058 E: lizze.toddmasters@gmail.com

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Note: That the products and manufacturers mentioned in the specification are considered the baseline for design and must meet minimum quality and type standards. However, alternative products of equal quality will be considered and approved by the architect after a thorough review.

SECTION 00300 - INSTRUCTIONS TO BIDDERS

Date_____

Name of Bidder_____

TO: WALES TOWNSHIP HALL
Liz Masters, Township Supervisor
1372 Wales Center Rd, Goodells, MI 48027
P: 810-543-3058 E: lizze.toddmasters@gmail.com

PROPOSAL FOR: HISTORIC EXTERIOR RESTORATION & ENTRANCE IMPROVEMENTS TO WALES TOWNSHIP HALL

1. BASE BID / ADDENDA

The undersigned has carefully examined the bidding and contract documents including the Instructions to Bidders, Agreement Between Owner and Contractor, General Conditions, Supplementary Conditions, Contract Requirements, General Requirements, Specifications, Drawings, and any and all Addenda issued, and has familiarized themselves with all local conditions to be encountered affecting the cost of the work and does hereby propose to perform all work and to furnish all of the labor, materials, tools, equipment and services necessary to complete the contract in connection with the above project, all in accordance with the contract documents prepared by Expressive Architecture, LLC, including the following addenda:

Addendum #:_____ Dated_____

Addendum #:_____ Dated_____

For the following BASE BID AMOUNT:

_____Dollars

(Bid in words)

$_____

(Bid in figures)

2. BID ALTERNATES

The undersigned Bidder proposes the amount below be added to or deducted from the Base Bid if particular alternates are accepted by Owner. Amounts listed for each alternate include costs of related coordination, modification, or adjustment.

A. Alternate **DEDUCT ALTERNATE #1**: SIDING

1. ADD____ DEDUCT____ NO CHANGE____ NOT APPLICABLE____.
2. _____ Dollars ($_____).
3. ADD____ DEDUCT____ calendar days to adjust the Contract Time for this alternate.

B. Alternate **ADD ALTERNATE #1**: WINDOWS

1. ADD____ DEDUCT____ NO CHANGE____ NOT APPLICABLE____.
2. _____ Dollars ($_____).
3. ADD____ DEDUCT____ calendar days to adjust the Contract Time for this alternate.

C. Alternate **ADD ALTERNATE #2**: RAILINGS

1. ADD____ DEDUCT____ NO CHANGE____ NOT APPLICABLE____.
2. _____ Dollars ($_____).
3. ADD____ DEDUCT____ calendar days to adjust the Contract Time for this alternate.

D. Alternate **ADD ALTERNATE #3**: CUPOLA

1. ADD____ DEDUCT____ NO CHANGE____ NOT APPLICABLE____.
2. _____ Dollars ($_____).
3. ADD____ DEDUCT____ calendar days to adjust the Contract Time for this alternate.

E. Alternate **ADD ALTERNATE #4**: ROOFING (STANDING SEAM-SLR)

1. ADD____ DEDUCT____ NO CHANGE____ NOT APPLICABLE____.
2. _____ Dollars ($_____).
3. ADD____ DEDUCT____ calendar days to adjust the Contract Time for this alternate.

F. Alternate **ADD ALTERNATE #5**: ELECTRICAL

1. ADD____ DEDUCT____ NO CHANGE____ NOT APPLICABLE____.
2. _____ Dollars ($_____).
3. ADD____ DEDUCT____ calendar days to adjust the Contract Time for this alternate.

G. Alternate **ADD ALTERNATE #6**: MILLWORK

1. ADD____ DEDUCT____ NO CHANGE____ NOT APPLICABLE____.
2. _____ Dollars ($_____).
3. ADD____ DEDUCT____ calendar days to adjust the Contract Time for this alternate.

3. STARTING and COMPLETION DATES: The undersigned agrees, if awarded the contract, that they will commence the work within thirty (30) calendar days after the Owner gives the Bidder written notice to commence the work.

Bidder's calendar days to complete the project_____

4. FEES FOR ADDITIONAL WORK – TO BE COMPLETED BY THE BIDDER:

For additional work performed upon instructions of the Owner by subcontractors of the undersigned, a fee of _____percent of the subcontractor's price will be charged by the undersigned for overhead, profit, etc.

For additional work performed upon instructions of the Owner by work forces of the undersigned, the charges shall be the actual cost of all labor and materials (less all discounts) plus a fee of _____percent , which includes all charges of the undersigned for overhead, profit, etc

5. BID BOND / INSURANCE / BONDS:

In compliance with the requirements, this proposal is accompanied by bid security in the form of a certified check or a surety company bond in the sum of at least 5% of the total bid to guarantee that a contract will be executed if the above proposal is accepted and awarded to the undersigned. It is agreed that the bid security will be retained as liquidated damages by the Owner if the bidder fails to execute a contract in accordance with his bid within forty-five days after receipt of bids. Also included in this proposal are premiums for insurance coverage and performance and payment bonds as described in Sections 00610 and 00650.

6. ADDRESS, LEGAL STATUS and SIGNATURE OF BIDDER:

The undersigned bidder does hereby designate the information given below as the legal name and address to which all notices, directions, or other communications may be served or mailed.

NAME:_____

ADDRESS:

CITY:_____ STATE:_____ ZIP:_____

PHONE NUMBER:_____ EMAIL ADDRESS:_____

The undersigned bidder does hereby declare that the bidder has the legal status listed below:

_____

(Individual, Co-partnership, LLC, Corporation incorporated under the laws of the State of)

If a Corporation
affix corporate seal hereinafter

Date:_____

Signed:_____

Note: If bid form is signed by an Agent, attach a certified Power of Attorney
Submit two (2) original copied of this proposal unless otherwise instructed.

END OF SECTION

SECTION 00500 AGREEMENT BETWEEN OWNER AND CONTRACTOR

PART 1 GENERAL

1.1 AGREEMENT FORM

A. Agreement between Owner and Contractor will be AIA Document A101, Standard Form of Agreement between Owner and Contractor, Latest Edition.

1.2 RELATED SECTIONS

A. Section 00650 – Insurance Requirements
B. Section 001000 – Instructions to Bidders
C. Section 014300 - Quality Assurances

PART 2 PRODUCTS

Not Used

PART 3 EXECUTION

Not Used

END OF SECTION

SECTION 00650 INSURANCE REQUIREMENTS

PART 1 GENERAL

1.1 INTRODUCTION

A. Certificates of Insurance acceptable to the Owner shall be filed with the Owner prior to commencement of the work. Certificates shall contain a provision that coverages afforded under the policies will not be modified or canceled until at least 30 days prior written notice has been given to the Owner. Submit two copies of each certificate to the Owner/Architect. Furnish to the Owner/Architect copies of any endorsements that are subsequently issues amending coverage or limits.

B. All insurances shall be carried with companies which are financially responsible. If any such insurance is due to expire during the term of the Contract, the Contractor shall not permit the coverage to lapse and shall furnish evidence of continuing coverage to the Owner/Architect.

C. Workmen's Compensation: As required by all applicable Federal and State laws, including Employer's Liability with a limit of at least $ 100,000.00.

D. Comprehensive General Liability: Including Contractor's Liability, Contingent Liability, Contractual Liability, Elevator Liability, Products including Completed Operations, all on occurrence basis with Personal Injury Coverage and Broad Form Property Damage. Including CCU related to Explosion, Collapse and Underground Property Damage. Products, including Completed Operations Liability shall be keep in force for at least 2 years after date of final completion.

E. Contractor's Liability Insurance, including Contractual Liability (Comprehensive Liability Form):

Minimum Coverage

Bodily Injury:	
Each Occurrence	$1,000,000.00
Aggregate	$2,000,000.00
Property Damage:	
Each Accident	$1,000,000.00
Aggregate	$2,000,000.00
Fire Damage	$ 50,000.00
Medical Expense	$ 5,000.00

F. Comprehensive Automobile Liability: including non-ownership and hired car coverage as well as vehicles.

Minimum Coverage

Bodily Injury and Death:	
Each Person	$1,000,000.00
Each Occurrence	$2,000,000.00
Property Damage	
Each Occurrence	$1,000,000.00

G. Umbrella Liability

Each Occurrence	$2,000,000.00
Aggregate	$2,000,000.00

H. Worker's Compensation and Employer's Liability

Each Accident	$ 100,000.00
Disease – Policy Limit	$ 500,000.00
Disease – Each Employee	$ 100,000.00

I. Contractor's insurance shall include coverage for liability assumed by Contractor under General Conditions A201, Paragraph 4.18, indemnification of General Conditions.

J. The Contractor shall furnish Owner with Certificates of Insurance showing by specific reference that each of the foregoing items has been provided. Furnish three copies of Certificate of insurance, using AIA Document G705.

K. Owner's Insurance: The Owner shall carry fire, extended coverage, hydrostatic coverage, vandalism, and malicious mischief insurance in the "completed value" form in an amount equal to full insurable value of the work including theft. Owner's insurance to be broad form Builder's Risk, naming Owner and all prime contractors as additional insured.

1.2 RELATED SECTIONS

A. Section 00500 - Agreement Between Owner and Contractor
B. Section 001000 – Instructions to Bidders
C. Section 014300 - Quality Assurances

END OF SECTION

SECTION 00 10 00 - INSTRUCTIONS TO BIDDERS

1. Introduction

A. These specifications, together with the drawings and other referenced documents, describe the requirements necessary for a bidder to follow in order to build a structure and related site work known as *Wales Township Hall historic renovation and entrance improvements.*

2. Bidder's Responsibility

A. Each Bidder by submitting a proposal, represents that he/she has reviewed and fully understands the contract documents.

B. Each Bidder by submitting a proposal, represents that he/she has visited the site and is familiar with all adjacent areas, means of approach to the site, and any other conditions relevant to the work to be performed.

C. Should a Bidder find any discrepancies, ambiguities, omissions, or be in doubt to any meaning contained in the Bid Documents, he/she shall immediately notify the designated project representative.

E. Failure to request clarifications utilizing the specified format and procedure will not relieve the Contractor of his/her responsibilities to perform the work as intended by these Documents. All clarifications shall be submitted in writing by selected General Contractors utilizing the Request for Clarification form included in Section 00 15 00. Forms shall be emailed to the office of Expressive Architecture using the contact information provided.

G. The General Contractor is required to pay the Building Permit Fee and all other permits required by the city as well as all required site and building testing fees and inspections. All utility tap fees and other governmental fees should be included in the Bid Price.

3. Form of Specifications

A. The form of these specifications generally follows the C.S.I. format as developed by the Construction Specifications Institute. The divisions of these specifications generally follow the work requirements of the major trades used to build the facility. The Contractor is not required to follow these trade divisions in letting the work; however, the Contractor shall be obligated to account for the work in conformance to these trade divisions.

B. The specifications listed herein are performance- type and do not in most instances list the names of products to be used. If a product is named, it shall be the absolute minimum standard that must be met in every respect by the product offered by the Contractor for use in the facility. The performance requirements are absolute and must be met by test when the facility is complete and in operation, regardless of the encountered environmental conditions. The Contractor is obligated to show by best engineering design practices and calculations that the performance criteria have been met.

4. Addenda to Drawings and Specifications

A. During the bid process, Bidders may be furnished certain Addenda covering additions, deductions or alterations to the Drawings and/or Specifications. Such Addenda shall be included in the work covered by the Proposal and shall become a part of the Contract Documents. Only Contractors, who have received Bid Documents directly from Expressive Architecture will receive any Addenda issued. The General Contractor shall be responsible for verifying that all Addenda items are covered in his submittal Proposal. Receipt of any Addenda shall be acknowledged on the Bid Proposal Form.

7. Construction Phasing Plan and Construction Schedule

A. The successful Bidder, immediately after award of the Contract, shall furnish the Owner with a Construction Progress Schedule. The Schedule shall indicate the progress outline, the total number work days needed to complete the project and agree with the Time for Completion in days listed in the Bid Proposal Form.

B. The successful Bidder shall be able to begin work within (1) week after award of Contract or issuance of building permit, whichever is later, progress substantially with the Construction Progress Schedule and complete all work within the time shown thereon unless delayed by jurisdictional or general strikes beyond the control of the Contractor, act of God or national emergency.

D. Completing the work contained in this contract, within the following time frame, is of the utmost importance to the Owner.

8. Mandatory Bid Add Alternates: Refer to Proposal Form Section 2 for required Bid alternates .

9. Special Notes

A. All **temporary and permanent services** shall be provided by the Contractor as part of the Proposal Bid.

B. The Contractor shall pay for all **utility tap-in fees, Building Permit fee and Demolition Permit fee**. The Contractor shall pay or all **testing fees and services** as required.

C. The contractor shall maintain safe, protected access to the existing building for the employess and public. Coordinate with client options for maintaining access and any temporary closures required prior to starting construction.

END OF SECTION 00 10 00

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REQUEST FOR CLARIFICATION

PROJECT:

HISTORIC EXTERIOR RESTORATION + ENTRANCE IMPROVEMENTS TO:

WALES TOWNSHIP HALL

1372 Wales Center Road,
Goodells, Michigan
eA Project # 22.022

ATTN: Jeremy Griffis jgriffis@expressivearchitecture.com

REQUESTING CONTRACTOR: _____

DATE: _____

ITEM OF CLARIFICATION:

RESPONSE:

FORM OF RESPONSE: ADDENDUM NO. _____ OTHER: _____

All questions received THREE (3) days prior to the bid date will be responded to in writing to all invited Contractors.

SECTION 01 33 00 – SUBMITTAL PROCEDURES

PART 1 - GENERAL

1.01 REFERENCES

A. All applicable portions of Division 1 - General Requirements are to be considered as included with this Section.

B. The following are minimum requirements and shall govern, except that all Federal, Local and/or State Codes and Ordinances shall govern when their requirements are in excess hereof.

1.02 DEFINITION

A. Shop drawings are drawings, diagrams, illustrations, schedules, performance charts, brochures, and other data which are prepared by the Contractor or any subcontractor, manufacturer, supplier, or distributor, and which illustrates some portion of the work.

B. Samples are physical examples furnished by the Contractor to illustrate materials, equipment, or workmanship, and to establish standards by which the work will be judged.

C. Subcontractor warranties will be required from specific enumerated trades. This warranty shall be in addition to written warranty furnished by the Contractor. Warranty shall be submitted on subcontractor's letterhead in conformance with sample form included in this Section of the Specifications, unless otherwise specified.

PART 2 - PRODUCTS

2.01 SHOP DRAWING SUBMITTALS

A. The Contractor shall check and approve all shop drawings and letters of intent for conformance with the Contract Documents prior to forwarding to the Architect for his review.

B. **If information on the shop drawings differ in any way from the contract plans and specifications, the Contractor must submit a letter along with the shop drawings highlighting the difference and explaining why he did it.** If the differences are not highlighted or brought to the attention of the Architect, the Architect's review of the shop drawings will not be construed to be approval of the difference.

C. All Submittals can be submitted as electronic (pdf) format.

D. Upon completion of the Architect's review, the Architect shall distribute the reviewed shop drawings to the Contractor except as noted below. Only those shop drawings noted to be "Reviewed" or "Furnish as Corrected" will be permitted for use at the project site.

2.03 SAMPLES

A. Material samples shall be submitted to the Architect and Client prior to purchase.

B. All materials incorporated in the work shall be fully equal to the reviewed samples.

2.04 WARRANTY

A. Warranty shall be for a minimum of one (1) year unless otherwise indicated, beginning on issuance of Certificate of Occupancy.

B. The completed warranty form and two (2) copies signed and countersigned shall be forwarded to the Owner.

2.05 SUBSTITUTION OF ALTERNATIVE MATERIAL OR SYSTEM

A. No substitutions of any variations deviates from the intent of the Specifications and Drawings, other than those which are approved by the Architect. No material, not accepted by the Architect in writing, may be substituted for a specified material.

B. Approval of a substitute, material or system, is generally considered to be equal to that named in the specifications and/or drawings.

C. Requests for review of any substitute must be submitted in writing to the Architect together with all necessary supporting data

D. The Architect shall be the sole judge of the suitability, acceptability, and equality of the substitute material and may accept or reject the same.

E. If the substitution of any material or equipment increases costs in any way, these costs shall be borne by the Contractor.

END OF SECTION 01 33 00

SECTION 01 43 00 - QUALITY ASSURANCE

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division01 Specification Sections, apply to this Section.

1.02 SUMMARY

A. Section includes administrative and procedural requirements for quality assurance and quality control.

B. Testing and inspecting services are required to verify compliance with requirements specified or indicated. These services do not relieve Contractor of responsibility for compliance with the Contract Document requirements.

1.03 DEFINITIONS

i. Quality-Assurance Services: Activities, actions, and procedures performed before and during execution of the Work to guard against defects and deficiencies and substantiate that proposed construction will comply with requirements.

i. Quality-Control Services: Tests, inspections, procedures, and related actions during and after execution of the Work to evaluate that actual products incorporated into the Work and completed construction comply with requirements. Services do not include contract enforcement activities performed by Architect.

i. Mockups: Full-size physical assemblies that are constructed on-site. Mockups are constructed to verify selections made under Sample submittals; to demonstrate aesthetic effects and, where indicated, qualities of materials and execution; to review coordination, testing, or operation; to show interface between dissimilar materials; and to demonstrate compliance with specified installation tolerances. Mockups are not Samples. Unless otherwise indicated, approved mockups establish the standard by which the Work will be judged.

1. Integrated Exterior Mockups: Mockups of the exterior envelope erected separately from the building but on Project site, consisting of multiple products, assemblies, and subassemblies.

1.04 CONFLICTING REQUIREMENTS

i. Referenced Standards: If compliance with two or more standards is specified and the standards establish different or conflicting requirements for minimum quantities or quality levels, comply with the most stringent requirement. Refer conflicting requirements that are different, but apparently equal, to Architect for a decision before proceeding.

B. Minimum Quantity or Quality Levels: The quantity or quality level shown or specified shall be the minimum provided or performed. The actual installation may comply exactly with the minimum quantity or quality specified, or it may exceed the minimum within reasonable limits. To comply with these requirements, indicated numeric values are minimum or maximum, as appropriate, for the context of requirements. Refer uncertainties to Architect for a decision before proceeding.

1.05 CONTRACTOR'S QUALITY-CONTROL PLAN

A. Quality-Control Plan, General: Submit quality-control plan within 10 days of Notice to Proceed. Submit in format acceptable to Architect. Identify personnel, procedures, controls, instructions, tests, records, and forms to be used to carry out Contractor's quality-assurance and quality-control responsibilities. Coordinate with Contractor's construction schedule.

B. Quality-Control Personnel Qualifications: Engage qualified full-time personnel trained and experienced in managing and executing quality-assurance and quality-control procedures similar in nature and extent to those required for Project.

C. Continuous Inspection of Workmanship: Describe process for continuous inspection during construction to identify and correct deficiencies in workmanship in addition to testing and inspection specified. Indicate types of corrective actions to be required to bring work into compliance with standards of workmanship established by Contract requirements and approved mockups.

D. Monitoring and Documentation: Maintain testing and inspection reports including log of approved and rejected results. Include work Architect has indicated as nonconforming or defective. Indicate corrective actions taken to bring nonconforming work into compliance with requirements. Comply with requirements of authorities having jurisdiction.

1.06 REPORTS AND DOCUMENTS

A. Test and Inspection Reports: Prepare and submit certified written reports specified in other Sections. Include the following:

1. Date of issue.
2. Project title and number.
3. Name, address, and telephone number of testing agency.
4. Dates and locations of samples and tests or inspections.
5. Names of individuals making tests and inspections.
6. Description of the Work and test and inspection method.
7. Identification of product and Specification Section.
8. Complete test or inspection data.
9. Test and inspection results and an interpretation of test results.
10. Record of temperature and weather conditions at time of sample taking and testing and inspecting.
11. Comments or professional opinion on whether tested or inspected Work complies with the Contract Document requirements.
12. Name and signature of laboratory inspector.
13. Recommendations on retesting and re-inspecting.

B. Manufacturer's Technical Representative's Field Reports: Prepare written information documenting manufacturer's technical representative's tests and inspections specified in other Sections. Include the following:

1. Name, address, and telephone number of technical representative making report.
2. Statement on condition of substrates and their acceptability for installation of product.
3. Statement that products at Project site comply with requirements.
4. Summary of installation procedures being followed, whether they comply with requirements and, if not, what corrective action was taken.
5. Results of operational and other tests and a statement of whether observed performance complies with requirements.

6. Statement whether conditions, products, and installation will affect warranty.
7. Other required items indicated in individual Specification Sections.

C. Permits, Licenses, and Certificates: For Owner's records, submit copies of permits, licenses, certifications, inspection reports, releases, jurisdictional settlements, notices, receipts for fee payments, judgments, correspondence, records, and similar documents, established for compliance with standards and regulations bearing on performance of the Work.

1.07 QUALITY ASSURANCE

A. General: Qualifications paragraphs in this article establish the minimum qualification levels required; individual Specification Sections specify additional requirements.

B. Manufacturer Qualifications: A firm experienced in manufacturing products or systems similar to those indicated for this Project and with a record of successful in-service performance, as well as sufficient production capacity to produce required units.

C. Fabricator Qualifications: A firm experienced in producing products similar to those indicated for this Project and with a record of successful in-service performance, as well as sufficient production capacity to produce required units.

D. Installer Qualifications: A firm or individual experienced in installing, erecting, or assembling work similar in material, design, and extent to that indicated for this Project, whose work has resulted in construction with a record of successful in-service performance.

E. Professional Engineer Qualifications: A professional engineer who is legally qualified to practice in jurisdiction where Project is located and who is experienced in providing engineering services of the kind indicated. Engineering services are defined as those performed for installations of the system, assembly, or product that are similar in material, design, and extent to those indicated for this Project.

1.08 MOCKUPS

A. Before installing portions of the Work requiring mockups, build mockups for each form of construction and finish required to comply with the following requirements, using materials indicated for the completed Work:

1. Build mockups in location and of size indicated or, if not indicated, as directed by Architect.

2. Notify Architect seven (7) days in advance of dates and times when mockups will be constructed.

3. Employ and identify supervisory personnel who will oversee mockup construction. Employ workers that will be employed during the construction at project.

4. Demonstrate the proposed range of aesthetic effects and workmanship.

5. Obtain Architect's review of the mockup shop drawing before starting work, fabrication, or construction.

6. Maintain mockups during construction in an undisturbed condition as a standard for judging the work under construction and all completed Work.

7. Retain subparagraph below as the default requirement and add specific requirements in individual specification sections.

8. Demolish and remove mockups when directed unless otherwise indicated.

9. Retain one or both of "Integrated Exterior Mockups" and "Room Mockups" paragraphs below describing special mockups as appropriate to project.

B. Integrated Exterior Mockup: Construct integrated exterior mockup according to shop drawing. Coordinate installation of exterior envelope materials and products for which mockups are required in individual specification sections, along with supporting materials. Use finish materials as drawn, specified and required by the local authorities.

1.09 QUALITY CONTROL

A. Owner Responsibilities: Where quality-control services are indicated as Owner's responsibility, Owner will engage a qualified testing agency to perform these services.

B. Contractor Responsibilities: Tests and inspections not explicitly assigned to Owner are Contractor's responsibility. Perform additional quality-control activities required to verify that the Work complies with requirements, whether specified or not.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION

3.01 REPAIR AND PROTECTION

A. General: On completion of testing, inspecting, sample taking, and similar services, repair damaged construction and restore substrates and finishes.

1. Provide materials and comply with installation requirements specified in other Specification Sections or matching existing substrates and finishes. Restore patched areas and extend restoration into adjoining areas with durable seams that are as invisible as possible. Comply with the Contract Document requirements for cutting and patching in Section017500 Project Closeout.

B. Protect construction exposed by or for quality-control service activities.

C. Repair and protection are Contractor's responsibility, regardless of the assignment of responsibility for quality-control services.

END OF SECTION 01 43 00

SECTION 01 70 00 - CONTRACT STANDARDS AND PROCEDURES

PART 1 - GENERAL

1.01 RELATED DOCUMENTS:

A. Attention is directed to Division 0, Bidding and Contract Requirements, and to Division 1, General Requirements, which are hereby made a part of this Section.

1.02 SUMMARY

A. Establish standards and comply with procedures as provided herein.

1.03 OPERATIONS:

A. Layout: Each Contractor shall locate and lay out the work and all its parts, and establish lines and levels accurately. Report any discrepancies to the Architect immediately upon discovery.

C. Use of Premises:

1. Confine apparatus, storage of materials, and operations of workmen to limits indicated by law, ordinances, permits or directions of the Owner. Do not unreasonably encumber the premises with materials.

D. Supervision: Shall be full time.

1.04 PROGRESS MEETINGS

A. Schedule and administer meetings throughout progress of the Work at intervals per contract.

B. Attendance Required: Job superintendent, major Subcontractors and suppliers, Owner, Architect (if required), as appropriate to agenda topics for each meeting. Notify such other parties as the Architect might designate as job conditions and progress might warrant.

C. Agenda:
1. Review minutes of previous meetings.
2. Review of Work progress.
3. Field observations, problems, and decisions.
4. Identification of problems that impede, or will impede, planned progress.
5. Review of submittals schedule and status of submittals.
6. Planned progress during succeeding work period.
7. Other business relating to Work.

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.

1.05 DOCUMENTS:

A. Agreement conditions stipulated in the following contract agreements are negotiable. Differences shall be as mutually agreed upon prior to final agreement.

B. Comply with the following:

1. Owner Contractor Agreement: Refer to General Conditions.

2. Application for Payment:
   a. Use A.I.A. Forms G-702 and G-703. Or form agreed to by owner prior to award of contract.

4. Sworn Statements:
   a Use standard form of title company.

5. Waiver of Lien:
   a. Use standard form of title company.

6. Insurance Certificate: Refer to General Conditions.

1.06 OCCUPANCY:

A. Substantial Completion:

1. When the contract work has progressed to a point that, in the judgment of the Architect, it is substantially complete, he will then issue a certificate of substantial completion as provided in Article 8 (Time) of the General Conditions of the Contract.

2. At this time, the Architect will require a list of the as yet uncompleted work items called a Punch List. The Contractor shall complete or correct the work on the punch list within thirty (30) days from the date of issuance of the certificate.

3. The list of items on the punch list to be completed or corrected is not necessarily complete, and the failure to include an item on it does not alter the responsibility of the Contractor to make complete all of the work in accordance with the Contract Documents, including authorized changes. Refer to Closing Procedure.

B. Prior to Substantial Completion:

1. If the period allowed for construction has elapsed, the Owner shall have the right to occupy all or part of the building when such can be reasonably done.

2. It shall be understood that the Owner shall not be liable for any inconvenience by such occupancy.

3. Occupancy or use of all or part of the building prior to completion shall not be construed as acceptance.

4. In the event of partial or full occupancy by the Owner prior to substantial completion, the Contractor shall notify the Insurance Carrier and obtain a "Use and Occupancy" waiver to prevent invalidation of such insurance by occupancy. Certificate of Endorsement for this waiver shall be furnished the Owner and the Architect.

5. Final payment shall not constitute acceptance of defective work or materials.

1.07 CLOSING PROCEDURES:

A. Financial:

1. Contractor shall furnish ample evidence to Architect and Owner that all financial obligations have been met.

2. The Contractor shall obtain from his surety, if any, a written statement releasing the Owner and the Architect from any and all obligations which might arise out of any unpaid, defaulted, or otherwise unsatisfied accounts.

B. Punch List:

1. Contractor shall complete and correct all items on the punch list as originally used and amended.

2. If contemplating application for final payment, the Contractor shall schedule one week in advance with the Architect a joint inspection visit to the project to determine if the Contract has been fully executed.

C. Record Drawings:

1. Deliver to Architect and Owner as required.

D. Warranties:

1. All warranties submitted shall be executed as required herein.

2. In addition to his own warranty, the Contractor shall furnish all of specified.

3. Warranties shall be dated at time of substantial completion.

E. Operating and Maintenance Data:

1. Prepare and furnish to the Owner three (3) bound copies "Operating and Maintenance Manual" on all equipment installed under Contract.

2. Manual shall include copies of all Manufacturer's "Operating and Service Instructions", including Parts List, Control Diagrams, Description of Control Systems, Operating, Electrical Wiring and any other information needed to understand, operate and maintain the equipment.
The names and addresses of all subcontractors shall be included. These instructions shall be custom prepared for this job; catalog cuts will not be accepted. Equipment shall be cross-referenced to Section of Specifications and to location shown and scheduled on drawings.

3. Include Test-Adjust-Balance Report in the Manual.

F. Other Documents Herein:

1. Contractor shall furnish all schedules, instructions, etc., as necessary to ensure safe and proper operation of the facilities of the building, and as specified herein.

2. Contractor shall also furnish reports of any and all tests and the performance of completed systems, as required in the specifications and all certificates of approval.

G. Final Certificate:

1. The issuance of such certificate does not relieve the Contractor of the responsibilities related to guaranteeing and warranting the performance of the facility as specified herein or otherwise provided.

PARTS 2 AND 3 - PRODUCTS AND EXECUTION

Not Applicable.

END OF SECTION 01 70 00

SECTION 01 75 00 – PROJECT CLOSEOUT

PART 1 - GENERAL

A. Work Specified Herein:

1. All requirements and procedures for submittal of pertinent data relating to closing out the Project upon completion of the project work. This Section is complementary to the General Conditions and Supplementary General Conditions and nothing herein shall be considered to waive any requirements of the General Conditions or Supplementary General Conditions.

B. Final Payment:

1. Receipt/review and acceptance of all items specified in this Section is a prerequisite for final payment.

C. Record Drawings:

1. Contractor shall provide reproducible Record Drawings at his cost or reproduced from the construction set by the Contractor at his discretion which shall clearly show all differences between the Contract for Construction as drawn and as installed for all work, as well as work added to the Contract for Construction which is not shown on the Drawings.

2. General Contractor shall maintain a set of Record Drawings at the job site. These shall be kept legible and current and shall be available for inspection at all times by the Project Representative. Show all changes in the Contract work, or work added, on these Record Drawings in a contrasting color, including work changed by Addendum or Bulletin.

3. Record Drawings shall contain the names, addresses and phone number of the Subcontractors and shall be signed by the General Contractor on the front cover.

4. Upon Substantial Completion of the Project work, the General Contractor shall submit Record Drawings to the Architect of Record for review.

D. Closeout Manual:

1. Upon completion of the Project the General Contractor shall re-submit to the Owner 3 complete ring bound 8-1/2" x 11" (fold larger sheets) copies of the approved closeout manual (commercial quality with plastic covers). The closeout manuals shall each include all information in accordance with the following outline:

a. CERTIFICATE OF OCCUPANCY - Document issued by local governmental authority certifying that the building complies with the provisions of applicable statutes and regulations and permitting occupancy for the designated use.

b. WARRANTY - The subcontractor shall warranty all work to the General Contractor for a period of one year from the date of Certificate of Substantial Completion unless specified for a longer period. In addition, each contractor shall repair work that proves to be defective in workmanship and/or materials due to above work without expense whatsoever to Owner.

2. General Requirements:

   a. Contractor shall submit written guarantee to the Owner stating that all work has been performed in accordance with the drawings and specifications (and authorized change orders, if any). Contractor shall also guarantee all work against defects due to faulty workmanship or materials and shall agree that during the guarantee period he shall make all repairs necessitated by reason of faulty workmanship or materials promptly and at no cost to the Owner.

      1) Compile specified warranties and bonds.
      2) Compile specified service and maintenance contracts.
      3) Co-execute submittals when so specified.
      4) Review submittals to verify compliance with Contract Documents.
      5) Submit to Architect of Record for review and transmittal to the Owner.
      6) Related requirements in other parts of Project Manual:
         a) Performance Bond and Payment Bond: Conditions of the Contract for Construction.
         b) General warranty of construction: Conditions of the Contract for Construction.
      7) Related requirements in other parts of project manual:
         a) Warranties and bonds required for specific products: each respective section of the specifications listed below.
         b) Provisions of warranties and bonds, duration: The respective section of specifications which specifies product.
         c) Copies of all approved Shop Drawings and material submittals.

3. Submittal Requirements:

   a. Assemble warranties, bonds and service and maintenance contracts, executed by each of the respective manufacturers, suppliers and subcontractors.

   b. Number of original signed copies required: 2 each

   c. Table of Contents: Neatly typed, in orderly sequence, Provide complete information on each item.
      1) Product of work item
      2) Firm, with name of principal, address and telephone number.
      3) Scope
      4) Date of beginning of warranty, bond or service and maintenance contract.
      5) Duration of warranty, bond for service maintenance contract.
      6) Provide information for Tenant's personnel: Proper procedures in case of failure. Instances which might affect the validity of warranty or bond.
      7) Contractor, name of responsible principal, address and telephone number.

4. Provide warranties for <u>all</u> subcontractors/manufacturers indicated within these Contract Documents.

5. MAINTENANCE DATA:
   a) Maintenance data should be provided for all of the following items. This list presents the minimum requirements. Additional data may be included at the discretion of the Contractor and shall be provided at the direction of the Owner.
      1) Site Improvements - requiring maintenance
      2) Metal Fabrications - requiring maintenance
      3) Finish Hardware

   d) ELECTRICAL SYSTEMS MANUAL - Equipment list including the following items for every piece of material and equipment supplied by the Electrical Systems Subcontractor.

      1) Name, model and manufacturer.
      2) Complete parts drawings and list.
      3) Local supply for parts or replacement with address and telephone numbers.
      4) Local service organizations for equipment with address and 24 hour telephone numbers.
      5) All approved shop drawings and/or submittals.
      6) Maintenance instructions with schedule of frequency of lubrication, cleaning, adjusting, replacing, etc.

E. Semi-Final and Final Inspections:

1. Closeout is hereby defined to include general requirements near end of contract time, in preparation for final acceptance, final payment, normal termination of contract, occupancy by owner and similar actions evidencing completion of the work. Specific requirements for individual units of work are specific throughout this specification. Time of closeout is directly related to "Substantial Completion".

F. Final Checkout of Structure and Equipment with Owner:

1. Arrange for each installer of work requiring continuing maintenance or operation, to meet with owner, at the project site, to provide basic instructions by manufacturer's representatives where installers are not expert in the required procedures. Review maintenance manuals, record documentation, tools, spare parts, and materials, lubricants, fuels, identification system, control sequences, hazards, cleaning and similar procedures and facilities. For operational equipment, demonstrate start-up, shut-down, emergency operations, noise and vibration adjustments, safety, economy/efficiency adjustments, energy effectiveness, and similar operations. Review maintenance and operations in relations with applicable warranties, agreements to maintain, bonds, and similar continuing commitments.

END OF SECTION 01 75 00

SECTION 02 05 00 - SELECTIVE DEMOLITION

PART 1 -GENERAL

1.01 RELATED DOCUMENTS:

A. The following are minimum requirements and shall govern, except that all Federal, Local and/or State Codes and Ordinances shall govern when their requirements are in excess hereof.

1.02 GUIDELINE SPECIFICATIONS:

A. This specification is for general use only. Refer to demolition drawings for specific instructions.

1.03 SUMMARY:

A. This Section requires the selective removal and subsequent offsite disposal or relocation of demolition work.

1.04 QUALITY ASSURANCE:

A. Contractor Qualifications: Engage only subcontractors who can demonstrate not less than five years successful experience in work of similar character.

B. To assure proper performance of these operations, the work in the Division is to be done by skilled personnel directed by qualified supervisors experienced in this type of work.

C. Comply with all applicable requirements of regulatory agencies.

D. If Contractor encounters asbestos during demolition, he shall stop work and notify Owner's representative immediately.

E. Maintain public security as directed.

1.05 SUBMITTALS:

A. Schedule: Submit schedule indicating proposed methods and sequence of operations for selective demolition work to Owner's Representative for review prior to commencement of work. Include coordination for shut-off, capping, and continuation of utility services if required and subject to the Owner's agreement, together with details for dust and noise control protection. Comply with final completion date.

1.06 JOB CONDITIONS:

A. Occupancy: Persons will be continuously occupying areas of the building immediately adjacent to areas of selective demolition. Conduct selective demolition work in manner that will minimize need for disruption of normal operations. Provide minimum of 72 hours advance notice to Owner of demolition activities which will severely impact Owner's normal operations.

B. Condition of Structures: Owner assumes no responsibility for actual condition of items or structures to be demolished.

C. Salvage Items: Certain materials/products/fabrications indicated to be reused, relocated and hooked up in future. Others are to be removed but not reused such as doors with hardware, or relocated; verify each with Owner. Carefully remove, clean, protect and store such items. Turn over items to be removed but not reused or relocated to Owner and obtain receipt. Store owner salvage items where directed in an orderly manner.

D. Partial Demolition and Removal: Items indicated to be removed but of salvageable value to Contractor may be removed from structure as work progresses. Transport salvaged items from site as they are removed.

E. Protection: Provide temporary barricades and other forms of protection to protect Owner's personnel from injury due to selective demolition work.

F. Utility Services: Maintain existing utilities indicated to remain in service and protect them against damage during demolition operations.

G. Environmental Controls: Use water sprinkling, temporary enclosures and other methods to limit dust and dirt migration. Comply with governing regulations pertaining to environmental protection.

PART 2 - PRODUCTS (Not Applicable**)**

PART 3 - EXECUTION

3.01 PREPARATION

A. General: Provide interior and exterior needling, shoring, bracing, or support to prevent movement, settlement, or collapse of areas to be demolished and adjacent facilities to remain.

B. Erect and maintain dust-proof partitions and closures as required to prevent spread of dust or fumes to occupied portions of the building. Include interior and exterior openings of all types, new and old. Partitions or closures shall be constructed of 2 x 4 framing with 5/8 gypsum wallboard both sides, sound insulated, and extended to floor above. Partitions to be fire rated where required.

3.02 DEMOLITION:

A. General: Perform selective demolition work in a systematic manner. Use such methods as required to complete work indicated on Drawings in accordance with phasing schedule and governing regulations.

3.03 DISPOSAL OF DEMOLISHED MATERIALS:

A. Remove from building debris, rubbish and other materials resulting from demolition operations. Transport and legally dispose of materials off-site.

3.04 CLEAN-UP AND REPAIR:

A. Repair demolition performed in excess of that required. Return elements of construction and surfaces to remain to condition existing prior to start operations. Repair adjacent construction of surface soiled or damaged by selective demolition work. Repair fireproofing damaged or removed in accordance with fire marshal's requirements.

END OF SECTION 02 05 00

SECTION 03 30 00 - CAST-IN-PLACE CONCRETE

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

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

1.02 SUMMARY

A. This Section specifies cast-in place concrete, including formwork, reinforcement, concrete materials, mix design, placement procedures, and finishes.

1.03 DEFINITIONS

A. Cementitious Materials: Portland cement alone or in combination with one or more of blended hydraulic cement, fly ash and other pozzolans, ground granulated blast-furnace slag, and silica fume.

1.04 SUBMITTALS

A. Product Data: For each type of manufactured material and product indicated.

B. Design Mixes: For each concrete mix. Include alternate mix designs when characteristics of materials, project conditions, weather, test results, or other circumstances warrant adjustments.

1. Indicate amounts of mix water to be withheld for later addition at Project site.

C. Steel Reinforcement Shop Drawings: Details of fabrication, bending, and placement, prepared according to ACI 315, "Details and Detailing of Concrete Reinforcement." Include material, grade, bar schedules, stirrup spacing, bent bar diagrams, arrangement, and supports of concrete reinforcement. Include special reinforcement required for openings through concrete structures.

D. Formwork Shop Drawings: Prepared by or under the supervision of a qualified professional engineer detailing fabrication, assembly, and support of formwork. Design and engineering of formwork are Contractor’s responsibility.

E. Material Test Reports: From a qualified testing agency indicating and interpreting test results for compliance of the following with requirements indicated, based on comprehensive testing of current materials:

F. Material Certificates: Signed by manufacturers certifying that each of the following items complies with requirements:

Retain list below with either paragraph above. Edit to suit Project.

1. Cementitious materials and aggregates.
2. Form materials and form-release agents.
3. Steel reinforcement and reinforcement accessories.
4. Admixtures.
5. Curing materials.
6. Floor and slab treatments.
7. Bonding agents.
8. Adhesives.
9. Vapor retarders.
10. Epoxy joint filler.
11. Joint-filler strips.
12. Repair materials.

1.05 QUALITY ASSURANCE

A. Installer Qualifications: An experienced installer who has completed concrete Work similar in material, design, and extent to that indicated for this Project and whose work has resulted in construction with a record of successful in-service performance.

B. Manufacturer Qualifications: A firm experienced in manufacturing ready-mixed concrete products complying with ASTM C 94 requirements for production facilities and equipment.

1. Manufacturer must be certified according to the National Ready Mixed Concrete Association's Certification of Ready Mixed Concrete Production Facilities.

C. Source Limitations: Obtain each type or class of cementitious material of the same brand from the same manufacturer's plant, each aggregate from one source, and each admixture from the same manufacturer.

D. ACI Publications: Comply with the following, unless more stringent provisions are indicated:

1. ACI 301, "Specification for Structural Concrete."

2. ACI 117, "Specifications for Tolerances for Concrete Construction and Materials."

1.06 DELIVERY, STORAGE, AND HANDLING

A. Deliver, store, and handle steel reinforcement to prevent bending and damage.

PART 2 - PRODUCTS

2.01 FORM-FACING MATERIALS

A. Smooth-Formed Finished Concrete: Form-facing panels that will provide continuous, true, and smooth concrete surfaces. Furnish in largest practicable sizes to minimize number of joints.

1. Plywood, metal, or other approved panel materials.

B. Rough-Formed Finished Concrete: Plywood, lumber, metal, or another approved material. Provide lumber dressed on at least two edges and one side for tight fit.

C Forms for Cylindrical Columns, Pedestals, and Supports: Metal, glass-fiber-reinforced plastic, paper, or fiber tubes that will produce surfaces with gradual or abrupt irregularities not exceeding specified formwork surface class. Provide units with sufficient wall thickness to resist plastic concrete loads without detrimental deformation.

D. Chamfer Strips: Wood, metal, PVC, or rubber strips, 3/4 by 3/4 inch (19 by 19 mm), minimum.

E. Form-Release Agent: Commercially formulated form-release agent that will not bond with, stain, or adversely affect concrete surfaces and will not impair subsequent treatments of concrete surfaces.

1. Formulate form-release agent with rust inhibitor for steel form-facing materials.

F. Form Ties: Factory-fabricated, removable or snap-off metal or glass-fiber-reinforced plastic form ties designed to resist lateral pressure of fresh concrete on forms and to prevent spalling of concrete on removal.

1. Furnish units that will leave no corrodible metal closer than 1 inch (25 mm) to the plane of the exposed concrete surface.

2. Furnish ties that, when removed, will leave holes not larger than 1 inch (25 mm) in diameter in concrete surface.

3. Furnish ties with integral water-barrier plates to walls indicated to receive dampproofing or waterproofing.

2.02 STEEL REINFORCEMENT

A. Reinforcing Bars: ASTM A 615/A 615M, Grade 60 (Grade 420), deformed.

2.03 REINFORCEMENT ACCESSORIES

A. Bar Supports: Bolsters, chairs, spacers, and other devices for spacing, supporting, and fastening reinforcing bars and welded wire fabric in place. Manufacture bar supports according to CRSI's "Manual of Standard Practice" from steel wire, plastic, or precast concrete or fiber-reinforced concrete of greater compressive strength than concrete, and as follows:

2.04 CONCRETE MATERIALS

A. Portland Cement: ASTM C 150, Type I or II, supplement with the following at foundations only:

1. Fly Ash: ASTM C 618, Class C or F.

2. Ground Granulated Blast-Furnace Slag: ASTM C 989, Grade 100 or 120.

B. Normal-Weight Aggregate: ASTM C 33, uniformly graded, and as follows:

1. Class: Moderate weathering region, but not less than 3M.

2. Nominal Maximum Aggregate Size: 1½ inch for walls, ¾ inch for Slabs.

C. Water: Potable and complying with ASTM C 94.

2.05 ADMIXTURES

A. General: Admixtures certified by manufacturer to contain not more than 0.1 percent water-soluble chloride ions by mass of cementitious material and to be compatible with other admixtures and cementitious materials. Do not use admixtures containing calcium chloride.

B. Air-Entraining Admixture: ASTM C 260.

Select chemical admixtures from paragraphs below.

C. Water-Reducing Admixture: ASTM C 494, Type A.

D. High-Range, Water-Reducing Admixture: ASTM C 494, Type F.

E. Water-Reducing and Accelerating Admixture: ASTM C 494, Type E.

F. Water-Reducing and Retarding Admixture: ASTM C 494, Type D.

2.06 CURING MATERIALS

A. Evaporation Retarder: Waterborne, monomolecular film forming, manufactured for application to fresh concrete.

B. Absorptive Cover: AASHTO M 182, Class 2, burlap cloth made from jute or kenaf, weighing approximately 9 oz./sq. yd. (305 g/sq. m) dry.

C. Moisture-Retaining Cover: ASTM C 171, polyethylene film or white burlap-polyethylene sheet.

D. Water: Potable.

E. Clear, Waterborne, Membrane-Forming Curing Compound: ASTM C 309, Type 1, Class B

F. Available Products: Subject to compliance with requirements, products that may be incorporated into the Work include, but are not limited to, the following:

1. Clear, Waterborne, Membrane-Forming Curing Compound:

a. Safe-Cure & Seal 20; ChemMasters.

b. High Seal; Conspec Marketing & Manufacturing Co., Inc.

c. Safe Cure and Seal; Dayton Superior Corporation.

d. Aqua Cure VOX; Euclid Chemical Co.

e. Kure-N-Seal WB; Sonneborn, Div. of ChemRex, Inc.

2.07 RELATED MATERIALS

Select one of three paragraphs below. Joint-filler strips are used in floor isolation joints.

A. Joint-Filler Strips: ASTM D 1751, asphalt-saturated cellulosic fiber, or ASTM D 1752, cork or self-expanding cork.

B. Bonding Agent: ASTM C 1059, Type II, non-redispersible, acrylic emulsion or styrene butadiene.

C. Epoxy-Bonding Adhesive: ASTM C 881, two-component epoxy resin, capable of humid curing and bonding to damp surfaces, of class and grade to suit requirements, and as follows:

1. Types I and II, non-load bearing, for bonding hardened or freshly mixed concrete to hardened concrete.

2.08 CONCRETE MIXES

A. Prepare design mixes for each type and strength of concrete determined by either laboratory trial mix or field test data bases, as follows:

1. Proportion normal-weight concrete according to ACI 211.1 and ACI 301.

B. Use a qualified independent testing agency for preparing and reporting proposed mix designs for the laboratory trial mix basis.

C. Walls: Proportion normal-weight concrete mix as follows:

1. Compressive Strength (28 Days): 4000 psi (24.1 MPa).

2. Maximum Slump: 3 inches (100 mm), plus or minus 1 inch.

3. Maximum Slump for Concrete Containing High-Range Water-Reducing Admixture: 8 inches (200 mm) after admixture is added to concrete with 2- to 4-inch (50- to 100-mm) slump, plus or minus 1 inch

4. Maximum Water Cement Ratio: 0.45

D. Topping Slab: Proportion normal-weight concrete mix as follows:

1. Compressive Strength (28 Days): 4000 psi (27.6 MPa).

2. Maximum Water Cement Ratio: 0.45

3. Maximum Slump: 4 inches (100 mm), plus or minus 1 inch

E. Cementitious Materials: For concrete exposed to deicers, limit percentage, by weight, of cementitious materials other than portland cement according to ACI 301 requirements.

F. Cementitious Materials: Limit percentage, by weight, of cementitious materials other than portland cement in concrete as follows:

1. Fly Ash: 25 percent.

2. Combined Fly Ash and Pozzolan: 25 percent.

3. Ground Granulated Blast-Furnace Slag: 25 percent.

4. Combined Fly Ash or Pozzolan and Ground Granulated Blast-Furnace Slag: 75 percent portland cement minimum, with fly ash or pozzolan not exceeding 25 percent.

5. Use of Fly Ash or Ground Granulated Blast-Furnace Slag is prohibited in Slab-on-Grade.

G. Air Content: Add air-entraining admixture at manufacturer's prescribed rate to result in concrete at point of placement having an air content as follows within a tolerance of plus 1 or minus 1.5 percent, unless otherwise indicated:

1. Air Content: 5.5 percent for 1-1/2-inch- (38-mm-) nominal maximum aggregate size, plus or minus 1 inch.

2. Air Content: 6 percent for ¾ inch nominal maximum aggregate size, plus or minus 1 inch.

H. Limit water-soluble, chloride-ion content in hardened concrete to 0.15 percent by weight of cement.

I. Admixtures: Use admixtures according to manufacturer's written instructions.

1. Use water-reducing admixture or high-range water-reducing admixture (superplasticizer) in concrete, as required, for placement and workability.

2. Use water-reducing and retarding admixture when required by high temperatures, low humidity, or other adverse placement conditions.

3. Use water-reducing admixture in pumped concrete, concrete for heavy-use industrial slabs and parking structure slabs, concrete required to be watertight, and concrete with a water-cementitious materials ratio below 0.50.

2.09 FABRICATING REINFORCEMENT

A. Fabricate steel reinforcement according to CRSI's "Manual of Standard Practice."

2.10 CONCRETE MIXING

A. Ready-Mixed Concrete: Measure, batch, mix, and deliver concrete according to ASTM C 94 and ASTM C 1116, and furnish batch ticket information.

1. When air temperature is between 85 and 90 deg F (30 and 32 deg C), reduce mixing and delivery time from 1-1/2 hours to 75 minutes; when air temperature is above 90 deg F (32 deg C), reduce mixing and delivery time to 60 minutes.

PART 3 - EXECUTION

3.01 FORMWORK

A. Design, erect, shore, brace, and maintain formwork, according to ACI 301, to support vertical, lateral, static, and dynamic loads, and construction loads that might be applied, until concrete structure can support such loads.

B. Construct formwork so concrete members and structures are of size, shape, alignment, elevation, and position indicated, within tolerance limits of ACI 117.

C. Limit concrete surface irregularities, designated by ACI 347R as abrupt or gradual, as follows:

1. Class B, 1/4 inch (6 mm).

D. Construct forms tight enough to prevent loss of concrete mortar.

E. Fabricate forms for easy removal without hammering or prying against concrete surfaces. Provide crush or wrecking plates where stripping may damage cast concrete surfaces. Provide top forms for inclined surfaces steeper than 1.5 horizontal to 1 vertical. Kerf wood inserts for forming keyways, reglets, recesses, and the like, for easy removal.

1. Do not use rust-stained steel form-facing material.

F. Set edge forms, bulkheads, and intermediate screed strips for slabs to achieve required elevations and slopes in finished concrete surfaces. Provide and secure units to support screed strips; use strike-off templates or compacting-type screeds.

G. Provide temporary openings for cleanouts and inspection ports where interior area of formwork is inaccessible. Close openings with panels tightly fitted to forms and securely braced to prevent loss of concrete mortar. Locate temporary openings in forms at inconspicuous locations.

H. Chamfer exterior corners and edges of permanently exposed concrete.

I. Form openings, chases, offsets, sinkages, keyways, reglets, blocking, screeds, and bulkheads required in the Work. Determine sizes and locations from trades providing such items.

J. Clean forms and adjacent surfaces to receive concrete. Remove chips, wood, sawdust, dirt, and other debris just before placing concrete.

K. Re-tighten forms and bracing before placing concrete, as required, to prevent mortar leaks and maintain proper alignment.

L. Coat contact surfaces of forms with form-release agent, according to manufacturer's written instructions, before placing reinforcement.

3.02 EMBEDDED ITEMS

A. Place and secure anchorage devices and other embedded items required for adjoining work that is attached to or supported by cast-in-place concrete. Use Setting Drawings, templates, diagrams, instructions, and directions furnished with items to be embedded.

1. Install anchor bolts, accurately located, to elevations required.

2. Install reglets to receive top edge of foundation sheet waterproofing and to receive through-wall flashings in outer face of concrete frame at exterior walls, where flashing is shown at lintels, shelf angles, and other conditions.

3.03 REMOVING AND REUSING FORMS

A. General: Formwork, for sides of beams, walls, columns, and similar parts of the Work, that does not support weight of concrete may be removed after cumulatively curing at not less than 50 deg F (10 deg C) for 24 hours after placing concrete provided concrete is hard enough to not be damaged by form-removal operations and provided curing and protection operations are maintained.

B. Clean and repair surfaces of forms to be reused in the Work. Split, frayed, delaminated, or otherwise damaged form-facing material will not be acceptable for exposed surfaces. Apply new form-release agent.

C. When forms are reused, clean surfaces, remove fins and laitance, and tighten to close joints. Align and secure joints to avoid offsets. Do not use patched forms for exposed concrete surfaces unless approved by Architect.

3.05 STEEL REINFORCEMENT

A. General: Comply with CRSI's "Manual of Standard Practice" for placing reinforcement.

1. Do not cut or puncture vapor retarder. Repair damage and reseal vapor retarder before placing concrete.

B. Clean reinforcement of loose rust and mill scale, earth, ice, and other foreign materials.

C. Accurately position, support, and secure reinforcement against displacement. Locate and support reinforcement with bar supports to maintain minimum concrete cover. Do not tack weld crossing reinforcing bars.

D. Set wire ties with ends directed into concrete, not toward exposed concrete surfaces.

3.06 JOINTS

A. General: Construct joints true to line with faces perpendicular to surface plane of concrete.

B. Construction Joints: Install so strength and appearance of concrete are not impaired, at locations indicated or as approved by Architect.

1. Place joints perpendicular to main reinforcement. Continue reinforcement across construction joints, unless otherwise indicated. Do not continue reinforcement through sides of strip placements of floors and slabs.

2. Locate horizontal joints in walls and columns at underside of floors, slabs, beams, and girders and at the top of footings or floor slabs.

3. Space vertical joints in walls as indicated. Locate joints beside piers integral with walls, near corners, and in concealed locations where possible.

5. Use a bonding agent at locations where fresh concrete is placed against hardened or partially hardened concrete surfaces.

C. Contraction (Control) Joints in Slabs-on-Grade: Construct contraction joints in slabs-on-grade to form panels of patterns as specified and shown on approved joint layout submittal. Use saw cuts 1/4 inch (6 mm) wide by 3/4 inch (19 mm) of slab depth or depth equal to the largest coarse aggregate size, whichever is greater:

1. Saw control joints with Sof-Cut Model GS-1000 (800) 776-3328 saw, immediately after final troweling with cutting completed within 2 hours after final pass of trowel. Vacuum saw cut concrete spoils from floor surface immediately behind the saw cutting operations.

a. Saw shall be designed for early entry, dry cutting with mechanical depth control sensor and skid plate to prevent raveling of the edges of the saw cut.

2. Contraction joints shall be placed in accordance with approved Shop Drawings, with a maximum panel area as specified below. The panel shall be as nearly square as possible. If panel cannot be square, do not exceed panel length to panel width ratio of 1 to 1-1/2. Conform to bay spacing wherever possible (at column centerlines, half bays, third bays, one quarter bays, or equal division to meet the specified spacing requirements).

3. Saw cut slabs on grade in accordance with the following maximum spacing:

a. 4 to 6 inches thick: 10 feet., maximum area with control joints 400 square feet.

b. 6 ¼ to 7 inches thick: 20 feet.

c. 7 ¼ to 8 inches thick: 20 feet.

4. Joint fillers and sealants are specified in Section 07900 – Joint Sealants.

D. Isolation Joints in Slabs-on-Grade: After removing formwork, install joint-filler strips at slab junctions with vertical surfaces, such as column pedestals, foundation walls, grade beams, and other locations, as indicated.

1. Extend joint-filler strips full width and depth of joint, terminating flush with finished concrete surface, unless otherwise indicated.

2. Terminate full-width joint-filler strips not less than 1/2 inch (12 mm) or more than 1 inch (25 mm) below finished concrete surface where joint sealants, specified in Division 7 Section "Joint Sealants," are indicated.

3. Install joint-filler strips in lengths as long as practicable. Where more than one length is required, lace or clip sections together.

3.07 CONCRETE PLACEMENT

A. Before placing concrete, verify that installation of formwork, reinforcement, and embedded items is complete and that required inspections have been performed.

B. Do not add water to concrete during delivery, at Project site, or during placement, unless approved by Architect.

C. Before placing concrete, water may be added at Project site, subject to limitations of ACI 301.

1. Do not add water to concrete after adding high-range water-reducing admixtures to mix.

D. Deposit concrete continuously or in layers of such thickness that no new concrete will be placed on concrete that has hardened enough to cause seams or planes of weakness. If a section cannot be placed continuously, provide construction joints as specified. Deposit concrete to avoid segregation.

E. Deposit concrete in forms in horizontal layers no deeper than 24 inches (600 mm) and in a manner to avoid inclined construction joints. Place each layer while preceding layer is still plastic, to avoid cold joints.

1. Consolidate placed concrete with mechanical vibrating equipment. Use equipment and procedures for consolidating concrete recommended by ACI 309R.

2. Do not use vibrators to transport concrete inside forms. Insert and withdraw vibrators vertically at uniformly spaced locations no farther than the visible effectiveness of the vibrator. Place vibrators to rapidly penetrate placed layer and at least 6 inches (150 mm) into preceding layer. Do not insert vibrators into lower layers of concrete that have begun to lose plasticity. At each insertion, limit duration of vibration to time necessary to consolidate concrete and complete embedment of reinforcement and other embedded items without causing mix constituents to segregate.

F. Deposit and consolidate concrete for floors and slabs in a continuous operation, within limits of construction joints, until placement of a panel or section is complete.

1. Consolidate concrete during placement operations so concrete is thoroughly worked around reinforcement and other embedded items and into corners.

2. Maintain reinforcement in position on chairs during concrete placement.

3. Screed slab surfaces with a straightedge and strike off to correct elevations.

4. Slope surfaces uniformly to drains where required.

5. Begin initial floating using bull floats or darbies to form a uniform and open-textured surface plane, free of humps or hollows, before excess moisture or bleedwater appears on the surface. Do not further disturb slab surfaces before starting finishing operations.

G. Cold-Weather Placement: Comply with ACI 306.1 and as follows. Protect concrete work from physical damage or reduced strength that could be caused by frost, freezing actions, or low temperatures.

1. When air temperature has fallen to or is expected to fall below 40 deg F (4.4 deg C), uniformly heat water and aggregates before mixing to obtain a concrete mixture temperature of not less than 50 deg F (10 deg C) and not more than 80 deg F (27 deg C) at point of placement.

2. Do not use frozen materials or materials containing ice or snow. Do not place concrete on frozen subgrade or on subgrade containing frozen materials.

3. Do not use calcium chloride, salt, or other materials containing antifreeze agents or chemical accelerators, unless otherwise specified and approved in mix designs.

H. Hot-Weather Placement: Place concrete according to recommendations in ACI 305R and as follows, when hot-weather conditions exist:

1. Cool ingredients before mixing to maintain concrete temperature below 90 deg F (32 deg C) at time of placement. Chilled mixing water or chopped ice may be used to control temperature, provided water equivalent of ice is calculated to total amount of mixing water. Using liquid nitrogen to cool concrete is Contractor's option.

2. Cover steel reinforcement with water-soaked burlap so steel temperature will not exceed ambient air temperature immediately before embedding in concrete.

3. Fog-spray forms, steel reinforcement, and subgrade just before placing concrete. Keep subgrade moisture uniform without standing water, soft spots, or dry areas.

3.08 FINISHING FORMED SURFACES

A. Smooth-Formed Finish: As-cast concrete texture imparted by form-facing material, arranged in an orderly and symmetrical manner with a minimum of seams. Repair and patch tie holes and defective areas. Remove fins and other projections exceeding 1/8 inch (3 mm) in height.

1. Apply to concrete surfaces exposed to public view or to be covered with a coating or covering material applied directly to concrete, such as waterproofing, dampproofing, veneer plaster, or painting.

3.09 FINISHING FLOORS AND SLABS

A. General: Comply with recommendations in ACI 302.1R for screeding, restraightening, and finishing operations for concrete surfaces. Do not wet concrete surfaces.

B. Trowel Finish: After applying float finish, apply first trowel finish and consolidate concrete by hand or power-driven trowel. Continue troweling passes and restraighten until surface is free of trowel marks and uniform in texture and appearance. Grind smooth any surface defects that would telegraph through applied coatings or floor coverings.

1. Apply a trowel finish to surfaces indicated and to floor and slab surfaces exposed to view or to be covered with resilient flooring, carpet, ceramic or quarry tile set over a cleavage membrane, paint, or another thin film-finish coating system.

2. Finish surfaces to the following tolerances, measured within 24 hours according to ASTM E 1155/E 1155M for a randomly trafficked floor surface:

   a. Specified overall values of flatness, F(F) 25; and levelness, F(L) 20; with minimum local values of flatness, F(F) 17; and levelness, F(L) 15.

3. Finish and measure surface so gap at any point between concrete surface and an unleveled freestanding 10-foot- (3.05-m-) long straightedge, resting on two high spots and placed anywhere on the surface, does not exceed the following:

   a. 1/8 inch (3.2 mm).

3.10 MISCELLANEOUS CONCRETE ITEMS

A. Filling In: Fill in holes and openings left in concrete structures, unless otherwise indicated, after work of other trades is in place. Mix, place, and cure concrete, as specified, to blend with in-place construction. Provide other miscellaneous concrete filling indicated or required to complete Work.

3.11 CONCRETE PROTECTION AND CURING

A. General: Protect freshly placed concrete from premature drying and excessive cold or hot temperatures. Comply with ACI 306.1 for cold-weather protection and with recommendations in ACI 305R for hot-weather protection during curing.

B. Evaporation Retarder: Apply evaporation retarder to unformed concrete surfaces if hot, dry, or windy conditions cause moisture loss approaching 0.2 lb/sq. ft. x h (1 kg/sq. m x h) before and during finishing operations. Apply according to manufacturer's written instructions after placing, screeding, and bull floating or darbying concrete, but before float finishing.

C. Formed Surfaces: Cure formed concrete surfaces, including underside of beams, supported slabs, and other similar surfaces. If forms remain during curing period, moist cure after loosening forms. If removing forms before end of curing period, continue curing by one or a combination of the following methods:

D. Unformed Surfaces: Begin curing immediately after finishing concrete. Cure unformed surfaces, including floors and slabs, concrete floor toppings, and other surfaces, by one or a combination of the following methods:

1. Moisture Curing: Keep surfaces continuously moist for not less than seven days with the following materials:

   a. Water.

   b. Continuous water-fog spray.

   c. Absorptive cover, water saturated, and kept continuously wet. Cover concrete surfaces and edges with 12-inch (300-mm) lap over adjacent absorptive covers.

2. Moisture-Retaining-Cover Curing: Cover concrete surfaces with moisture-retaining cover for curing concrete, placed in widest practicable width, with sides and ends lapped at least 12 inches (300 mm), and sealed by waterproof tape or adhesive. Cure for not less than seven days.

Immediately repair any holes or tears during curing period using cover material and waterproof tape.

a. Moisture cure or use moisture-retaining covers to cure concrete surfaces to receive floor coverings.

b. Moisture cure or use moisture-retaining covers to cure concrete surfaces to receive penetrating liquid floor treatments.

c. Cure concrete surfaces to receive floor coverings with either a moisture-retaining cover or a curing compound that the manufacturer recommends for use with floor coverings.

3. Curing Compound: Apply uniformly in continuous operation by power spray or roller according to manufacturer's written instructions. Recoat areas subjected to heavy rainfall within three hours after initial application. Maintain continuity of coating and repair damage during curing period.

3.13 JOINT FILLING

A. Prepare, clean, and install joint filler according to manufacturer's written instructions.

1. Defer joint filling until concrete has aged at least six months. Do not fill joints until construction traffic has permanently ceased.

B. Remove dirt, debris, saw cuttings, curing compounds, and sealers from joints; leave contact faces of joint clean and dry.

C. Install semirigid epoxy joint filler full depth in saw-cut joints and at least 2 inches (50 mm) deep in formed joints. Overfill joint and trim joint filler flush with top of joint after hardening.

3.14 CONCRETE SURFACE REPAIRS

A. Defective Concrete: Repair and patch defective areas when approved by Architect. Remove and replace concrete that cannot be repaired and patched to Architect's approval.

B. Patching Mortar: Mix dry-pack patching mortar, consisting of one part portland cement to two and one-half parts fine aggregate passing a No. 16 (1.2-mm) sieve, using only enough water for handling and placing.

C. Repairing Formed Surfaces: Surface defects include color and texture irregularities, cracks, spalls, air bubbles, honeycombs, rock pockets, fins and other projections on the surface, and stains and other discolorations that cannot be removed by cleaning.

1. Immediately after form removal, cut out honeycombs, rock pockets, and voids more than 1/2 inch (13 mm) in any dimension in solid concrete but not less than 1 inch (25 mm) in depth. Make edges of cuts perpendicular to concrete surface. Clean, dampen with water, and brush-coat holes and voids with bonding agent. Fill and compact with patching mortar before bonding agent has dried. Fill form-tie voids with patching mortar or cone plugs secured in place with bonding agent.

2. Repair defects on surfaces exposed to view by blending white portland cement and standard portland cement so that, when dry, patching mortar will match surrounding color. Patch a test area at inconspicuous locations to verify mixture and color match before proceeding with patching. Compact mortar in place and strike off slightly higher than surrounding surface.

3. Repair defects on concealed formed surfaces that affect concrete's durability and structural performance as determined by Architect.

D. Repairing Unformed Surfaces: Test unformed surfaces, such as floors and slabs, for finish and verify surface tolerances specified for each surface. Correct low and high areas. Test surfaces sloped to drain for trueness of slope and smoothness; use a sloped template.

1. Repair finished surfaces containing defects. Surface defects include spalls, popouts, honeycombs, rock pockets, crazing and cracks in excess of 0.01 inch (0.25 mm) wide or that penetrate to reinforcement or completely through unreinforced sections regardless of width, and other objectionable conditions.

2. After concrete has cured at least 14 days, correct high areas by grinding.

3. Correct localized low areas during or immediately after completing surface finishing operations by cutting out low areas and replacing with patching mortar. Finish repaired areas to blend into adjacent concrete.

4. Correct other low areas scheduled to remain exposed with a repair topping. Cut out low areas to ensure a minimum repair topping depth of 1/4 inch (6 mm) to match adjacent floor elevations. Prepare, mix, and apply repair topping and primer according to manufacturer's written instructions to produce a smooth, uniform, plane, and level surface.

6. Repair defective areas, except random cracks and single holes 1 inch (25 mm) or less in diameter, by cutting out and replacing with fresh concrete. Remove defective areas with clean, square cuts and expose steel reinforcement with at least 3/4 inch (19 mm) clearance all around. Dampen concrete surfaces in contact with patching concrete and apply bonding agent. Mix patching concrete of same materials and mix as original concrete except without coarse aggregate. Place, compact, and finish to blend with adjacent finished concrete. Cure in same manner as adjacent concrete.

7. Repair random cracks and single holes 1 inch (25 mm) or less in diameter with patching mortar. Groove top of cracks and cut out holes to sound concrete and clean off dust, dirt, and loose particles. Dampen cleaned concrete surfaces and apply bonding agent. Place patching mortar before bonding agent has dried. Compact patching mortar and finish to match adjacent concrete. Keep patched area continuously moist for at least 72 hours.

E. Perform structural repairs of concrete, subject to Architect's approval, using epoxy adhesive and patching mortar.

F. Repair materials and installation not specified above may be used, subject to Architect's approval.

3.15 FIELD QUALITY CONTROL

A. Testing Agency: Engage a qualified independent testing and inspecting agency to sample materials, perform tests, and submit test reports during concrete placement according to requirements specified in this Article.

B. Testing Services: Testing of composite samples of fresh concrete obtained according to ASTM C 172 shall be performed according to the following requirements:

1. Testing Frequency: Obtain one composite sample for each day's pour of each concrete mix exceeding 5 cu. yd. (4 cu. m), but less than 25 cu. yd. (19 cu. m), plus one set for each additional 50 cu. yd. (38 cu. m) or fraction thereof.

2. Testing Frequency: Obtain at least one composite sample for each 100 cu. yd. (76 cu. m) or fraction thereof of each concrete mix placed each day.

    a. When frequency of testing will provide fewer than five compressive-strength tests for each concrete mix, testing shall be conducted from at least five randomly selected batches or from each batch if fewer than five are used.

3. Slump: ASTM C 143; one test at point of placement for each composite sample, but not less than one test for each day's pour of each concrete mix. Perform additional tests when concrete consistency appears to change.

4. Air Content: ASTM C 231, pressure method, for normal-weight concrete; ASTM C 173, volumetric method, for structural lightweight concrete; one test for each composite sample, but not less than one test for each day's pour of each concrete mix.

5. Concrete Temperature: ASTM C 1064; one test hourly when air temperature is 40 deg F (4.4 deg C) and below and when 80 deg F (27 deg C) and above, and one test for each composite sample.

    a. Cast and field cure one set of four standard cylinder specimens for each composite sample.

6. Compressive-Strength Tests: ASTM C 39; test two laboratory-cured specimens at 7 days and two at 28 days.

    a. Test two field-cured specimens at 7 days and two at 28 days.

    b. A compressive-strength test shall be the average compressive strength from two specimens obtained from same composite sample and tested at age indicated.

C. When strength of field-cured cylinders is less than 85 percent of companion laboratory-cured cylinders, Contractor shall evaluate operations and provide corrective procedures for protecting and curing in-place concrete.

D. Strength of each concrete mix will be satisfactory if every average of any three consecutive compressive-strength tests equals or exceeds specified compressive strength and no compressive-strength test value falls below specified compressive strength by more than 500 psi (3.4 MPa).

E. Test results shall be reported in writing to Architect, concrete manufacturer, and Contractor within 48 hours of testing. Reports of compressive-strength tests shall contain Project identification name and number, date of concrete placement, name of concrete testing and inspecting agency, location of concrete batch in Work, design compressive strength at 28 days, concrete mix proportions and materials, compressive breaking strength, and type of break for both 7-and 28-day tests.

F. Nondestructive Testing: Impact hammer, sonoscope, or other nondestructive device may be permitted by Architect but will not be used as sole basis for approval or rejection of concrete.

G. Additional Tests: Testing and inspecting agency shall make additional tests of concrete when test results indicate that slump, air entrainment, compressive strengths, or other requirements have not been met, as directed by Architect. Testing and inspecting agency may conduct tests to determine adequacy of concrete by cored cylinders complying with ASTM C 42 or by other methods as directed by Architect.

END OF SECTION 03 30 00

SECTION 04 20 00 - UNIT MASONRY

PART 1 - GENERAL

1.01 RELATED DOCUMENTS:

A. A. All applicable portions of Division 1 - General Requirements are to be considered as included with this Section.

B. The following are minimum requirements and shall govern except that all Federal, Local, and/or State Codes and Ordinances shall govern when their requirements are in excess hereof.

1.02 PERFORMANCE REQUIREMENTS:

A. Water Permeance of Masonry: ASTM E 514, “Standard Test Method for Water Penetration and Leakage through Masonry”.

B. Flexural Bond Strength of Masonry: ASTM C 1357, “Standard Test Method for Evaluating Masonry Bond Strength”.

C. Compressive Strength of Masonry Prisms: ASTM C 1314, “Standard Test Method for Constructing and Testing Masonry Prisms Used to Determine Compliance with Specified Compressive Strength of masonry”.

D. Drying Shrinkage of Mortar: ASTM C 1148, “Standard Test Method for Measuring the Drying Shrinkage of Masonry Mortar”.

1.03 SUBMITTALS: In addition to product data, submit the following:

A. Material certificates for each different masonry product required.

B. Material test reports from a qualified independent testing agency for mortar, grout mixes, and masonry units.

1.05 QUALITY ASSURANCE:

A. Building Code Requirements for Masonry Structures: (ACI 530/ASCE 5/TMS 402) as published by the American Concrete Institute.

B. Pre-construction Testing: A qualified independent testing agency shall perform the following tests to establish compliance of proposed materials with specified requirements:

1. Concrete Masonry Unit Test: For each different concrete masonry unit indicated, test units for strength, absorption, and moisture content per ASTM C 140.

2. Test mortar properties per test methods of ASTM C 270.

3. Evaluate mortar composition and properties per ASTM C 780.

4. Test grout compressive strength per ASTM C 1019.

5. Test Reports prepared by a qualified independent laboratory indicating compliance with the performance requirements for integral Concrete Masonry Units and mortar water-repellency as tested using:

(a) ASTM E 514, extended to 72 hours.
(b) ASTM C 1357.
(c) ASTM C 1314.
(d) ASTM C 1148.

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

1. Cold-Weather Construction: Heat mixing water and sand to produce mortar and grout temperatures between 40 and 120 deg F (4 and 49 deg C). Maintain mortar and grout above freezing. Heat masonry units to 40 deg F (4 deg C) if grouting.

2. Cold-Weather Protection: Cover masonry with insulating blankets or provide enclosure and heat to maintain temperatures above 32 deg F (0 deg C) for 48 hours after construction. Install wind breaks when wind velocity exceeds 15 mi./h (25 km/h).

E. Hot-Weather Requirements: Protect unit masonry work from excessive evaporation of water from mortar and grout. Do not apply mortar to substrates with temperatures of 100 deg F (38 deg C) and above.

PART 2 - PRODUCTS

2.01 CONCRETE MASONRY UNITS:

A. ASTM C 90 and as follows:

1. Compressive Strength: 1900 psi (13.1 MPa) minimum average net-area compressive strength.

a. Weight Classification: Normal weight.

1.) Provide Type I, moisture-controlled units.

b. Size: Manufactured to the actual dimensions of 3/8 inch (10 mm) less than nominal sizes indicated on Drawings.

c. Exposed Faces: Manufacturer's standard color and texture. Units shall be smooth faced and split faced as indicated on the drawings.

d. Special shapes for lintels, corners, jambs, sash, control joints, headers, bonding, and other special conditions.

e. Square-edged units for outside corners, except where indicated as bullnose.

2.02 MORTAR AND GROUT MATERIALS:

A. Portland Cement: ASTM C 150, Type I or II, except Type III may be used for cold-weather construction.

B. For pigmented mortars, use premixed, colored-cement or cement-lime mix of formulation required to produce color indicated.

C. Hydrated Lime: ASTM C 207, Type S.

D. Aggregate for Mortar: ASTM C 144; except for joints less than 1/4 inch (6.5 mm), use aggregate graded with 100 percent passing the No. 16 (1.18 mm) sieve.

E. Aggregate for Grout: ASTM C 404.

F. Water: Potable.

G. Steel Reinforcing Bars: Billet steel complying with ASTM A 615, Grade 60 (ASTM A 615M, Grade 400).

H. Admixtures for Grout: Comply with ASTM C 476.

2.03 JOINT REINFORCEMENT:

A. Provide joint reinforcement formed from galvanized carbon-steel wire, ASTM A 641 (ASTM A 641M), Class 1, for interior walls; and ASTM A 153, Class B-2, for exterior walls.

B. Description: Welded-wire units prefabricated with deformed continuous side rods and plain cross rods into straight lengths of not less than 10 feet (3 m), with prefabricated corner and tee units, and complying with requirements indicated below:

1. Wire Diameter for Side Rods: 0.1875 inch (4.8 mm).
2. Wire Diameter for Cross Rods: 0.1483 inch (3.8 mm).

C. For single-wythe masonry, provide truss design with single pair of side rods.

D. For multi-wythe masonry, provide type as follows:

1. Ladder design with 1 side rod for each face shell of hollow masonry units more than 4 inches (100 mm) in width, plus 1 side rod for each wythe of masonry 4 inches (100 mm) or less in width.
2. Tab design with single pair of side rods and rectangular box-type cross ties extended into the outer wythe.

2.04 TIES AND ANCHORS, GENERAL:

A. Provide ties and anchors that comply with the following requirements, unless otherwise indicated.

1. Galvanized Carbon-Steel Wire: ASTM A 82; with ASTM A 153, Class B-2 coating for exterior walls; and with ASTM A 641 (ASTM A 641M), Class 1 coating for interior walls.

2.05 EMBEDDED FLASHING MATERIALS:

A. Sheet-Metal Flashing: Fabricate from the following metal:

1. Copper: 16 oz./sq. ft. (5 kg/sq. m) weight or 0.0216 inch (0.5 mm) thick, full concealed.
2. Copper-Fabric Laminate: Copper sheet weighing 7 oz./sq. ft. (2 kg/sq. m), bonded with asphalt between 2 layers of glass-fiber cloth.

2.06 MISCELLANEOUS MASONRY ACCESSORIES:

A. Compressible Filler: Premolded filler strips complying with ASTM D 1056, Type 2, Class A, Grade 1; compressible up to 35 percent; of width and thickness indicated.

B. Preformed Control-Joint Gaskets: Designed to fit standard sash block and to maintain lateral stability in masonry wall; size and configuration as indicated, made from styrene-butadiene rubber complying with ASTM D 2000, Designation M2AA-805.

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

D. Expansion joints: Factory cured strip of silicone sealant adhered to rectangular polyurethane backer.

1. "Everlastic Wide Joint Seal" as manufactured by Williams Product Inc.
2. Other approved equal.

2.07 WEEP HOLES:

A. Plastic Tubing: Medium-density polyethylene, **rectangular** in section, sized to fill full head joint.

2.08 INSULATION: (not required)

2.09 CONCRETE MASONRY UNITS & MORTAR ADMIXTURE INTEGRAL WATER-REPELLENT:

A. Acceptable products:

1. Acme Shield

B. Submittals:

1. Spec-Data Sheet on Integral Water-Repellent Admixtures for Block and Mortar.
2. Data Sheet on Mortar Admixture.
3. Technical Bulletin on Cleaning Masonry Containing Integral Water-Repellant.
4. Test Reports prepared by a qualified independent laboratory indicating compliance with the performance requirements for integral mortar water-repellency as tested using:

(a) ASTM E 514, extended to 72 hours.
(b) ASTM C 1357.
(c) ASTM C 1314.
(d) ASTM C 1148.

C. Sample Panel: Construct a sample panel to determine the compatibility of materials and the effect of the materials and construction procedures on the final appearance of the wall. Use jobsite materials, including specified water-repellent CMU and mortar to construct sample panel. The CMU sample panels erected shall represent the range of texture and color permitted for the

project. Prepare more than one sample batch of mortar, especially when coloring pigments are added to the mortar, to establish desired aesthetics and performance. Perform all construction procedures on sample panel, including cleaning and application of coatings and sealants. Retain sample panel during construction as standard for judging completed masonry work. Acceptance of sample panel does not constitute approval of deviations from materials contained in sample panel, unless such deviations are specifically approved by Architect in writing.

D. Site Storage:

1. Store integral water-repellent mortar admixture in an area where temperature is maintained between 4°C (40°F) to 38°C (100°F).
2. Do not allow integral water-repellent mortar admixture to freeze; discard any frozen admixture.

E. Warranty:

1. Integral water-repellent mortar admixture shall be warranted by admixture manufacturer to be free of defects and to meet manufacturer's published physical and chemical properties.
2. Installer shall warrant that only mortar containing integral water-repellent mortar admixture at the manufacturer's recommended addition rate has been placed in exterior walls.

2.10 MASONRY CLEANERS:

A. Job-Mixed Detergent Solution: Solution of ½ cup (0.14 L) dry measure tetrasodium pyrophosphate and ½ cup (0.14 L) dry measure laundry detergent dissolved in 1 gal. (4 L) of water.

2.11 MORTAR AND GROUT MIXES:

A. Do not use admixtures unless otherwise indicated. Do not use calcium chloride in mortar or grout.

B. Mortar for Unit Masonry: Comply with ASTM C 270, Proportion Specification, for types of mortar indicated below:

1. Limit cementitious materials in mortar to portland cement and lime.
2. For masonry below grade, in contact with earth, and where indicated, use Type M.

C. For exterior, above-grade, load-bearing and non load-bearing walls and parapet walls; for interior load-bearing walls; use Type S.

D. For interior non-load bearing partitions and for other applications where another type is not indicated use type N.

C. Grout for Unit Masonry: Comply with ASTM C 476. Use grout of consistency to completely fill spaces intended to receive grout.

D. Source Quality Control: The Contractor will employ and pay a qualified independent testing agency to perform the following tests:

1. Concrete Masonry Unit Tests: ASTM C 140, for each type of concrete masonry unit indicated.
2. Store integral water-repellent mortar admixture in an area where temperature is maintained between 4°C (40°F) to 38°C (100°F).
3. Do not allow integral water-repellent mortar admixture to freeze; discard any frozen admixture.

E. Warranty:

1. Integral water-repellent mortar admixture shall be warranted by admixture manufacturer to be free of defects and to meet manufacturer's published physical and chemical properties.
2. Installer shall warrant that only mortar containing integral water-repellent mortar admixture at the manufacturer's recommended addition rate has been placed in exterior walls.

PART 3 - EXECUTION

3.01 LAYING MASONRY:

A. Cut masonry units with motor-driven saws. Allow units cut with water-cooled saws to dry before placing, unless wetting of units is specified. Install cut units with cut surfaces and, where possible, cut edges concealed.

B. Mix units for exposed unit masonry from several pallets or cubes as they are placed to produce uniform blend of colors and textures.

C. Construction Tolerances: As follows:

1. Variation from Plumb: For vertical lines and surfaces do not exceed 1/4 inch in 10 feet (6 mm in 3 m), nor 3/8 inch in 20 feet (10 mm in 6 m), nor ½ inch in 40 feet (12 mm in 12 m) or more. For vertical alignment of head joints, do not exceed plus or minus 1/4 inch in 10 feet (6 mm in 3 m) nor ½ inch (12 mm) maximum.
2. Variation from Level: Do not exceed 1/4 inch in 20 feet (6 mm in 6 m) nor ½ inch in 40 feet (12 mm in 12 m).
3. Variation of Linear Building Line: For position shown in plan, do not exceed 1/4 inch in 20 feet (12 mm in 6 m) nor 3/4 inch in 40 feet (19 mm in 12 m).
4. Variation in Cross-Sectional Dimensions: For columns and thickness of walls, from dimensions shown, do not exceed minus 1/4 inch (6 mm) nor plus 2 inch (12 mm).
5. Variation in Mortar-Joint Thickness: Do not vary from bed-joint thickness indicated by more than plus or minus 1/8 inch (3 mm), with a maximum thickness limited to ½ inch (12 mm). Do not vary from head-joint thickness indicated by more than plus or minus 1/8 inch (3 mm).

D. Lay out walls in advance for accurate spacing of surface bond patterns and for accurate locating of openings, movement-type joints, returns, and offsets. Avoid the use of less-than-half-size units at corners, jambs, and where possible at other locations.

1. Bond Pattern for Exposed Masonry: Lay exposed masonry in running bond pattern with joints in line with center of unit below. Do not use units with less than nominal 4 inch (100 mm) horizontal face dimensions at corners or jambs.

2. Built-In Work: As construction progresses, build-in items specified under this and other Sections of the Specifications. Fill in solidly with masonry around built-in items. Lay solid or bond.
3. Fill cores in hollow concrete masonry units with grout 24 inches (600 mm) under bearing plates, beams, lintels, posts, precast concrete, and similar items, unless otherwise indicated.
4. Tool exposed joints slightly concave when thumbprint hard, using a jointer larger than joint thickness, unless otherwise indicated. Point scored block with mortar matching mortar joints.
5. Keep cavities clean of mortar droppings and other materials during construction. Strike joints facing cavities flush. Use wood strips temporarily placed in cavity to collect mortar droppings. As work progresses, remove strips clean of mortar droppings, and replace in cavity.
6. Provide continuous horizontal-joint reinforcement as indicated. Install with a minimum cover of 5/8 inch (16 mm) on exterior, ½ inch (13 mm) elsewhere. Lap a minimum of 6 inches (150 mm). Space 16 inches o.c. for above grade applications and 8" o.c. for below grade applications. Provide continuity at corners and wall intersections by using prefabricated "L" and "T" sections.
7. Anchor masonry to structural members where masonry abuts or faces structural members to comply with the following:

    a. Provide a 1 inch (25 mm) open space between masonry and structural member, unless otherwise indicated.
    b. At control joints anchor to column either side of joint.

8. Anchor masonry to structural members with flexible anchors embedded in masonry joints and attached to structure.
9. Anchor masonry veneers to metal studs with masonry-veneer anchors to comply with the following requirements:

    a. Fasten each anchor support section through sheathing to metal studs with non-corrosive metal fasteners. Calibrate tightening of screw so not to strip metal. Interlock tie to support section and embed in masonry. Space 16 inches o.c. vertically and 24 inches o.c. horizontally.

10. Provide air space between back of masonry veneer and face of sheathing or block backup. Above flashing within air space fill void with pea gravel one brick high. Space weep holes 24 inches o.c. Collar-joints to be filled with mortar; occur where indicated.
11. Provide masonry lintels where shown. Provide precast lintels matching concrete masonry units in color, texture, and compressive strength and with reinforcement bars indicated or required to support loads indicated.
12. Install embedded flashing and weep holes in masonry at base of masonry walls, shelf angles, lintels, ledges, other obstructions to the downward flow of water in the wall, and where indicated. Extend flashing upward through the cavity and into the joint of the masonry backup, except at sheathing turn up, adhere to sheathing, and cover with the air filtration barrier.

    a. Extend flashing 4 inches (100 mm) at ends and turn up not less than 2 inches (50 mm) to form a pan.

13. Trim wicking material used in weep holes flush with outside face of wall after mortar has set.
14. Locate control joints 26'-0" o.c. unless otherwise indicated.

15. Cast bond beam cores with continuous reinforcement and grouted.
16. Solid grout steel door frames.

3.02 GROUTING:

A. Do not place grout until entire height of masonry to be grouted has attained sufficient strength to resist grout pressure.

B. Do not exceed the following pour heights for fine grout:

1. For minimum widths of grout spaces of 3/4 inch (19 mm) or for minimum grout space of hollow unit cells of 1-1/2 by 2 inches (38 by 51 mm), pour height of 12 inches (305 mm).
2. For minimum widths of grout spaces of 2 inches (51 mm), pour height of 60 inches (1524 mm).
   a. Do not exceed the following pour heights for coarse grout:
3. For minimum widths of grout spaces of 1-1/2 inches (38 mm), pour height of 12 inches (305 mm).
4. For minimum widths of grout spaces of 2 inches (51 mm), pour height of 60 inches (1524 mm).
5. For minimum widths of grout spaces of 2-1/2 inches (63 mm) or for minimum grout space of hollow unit cells of 3 by 3 inches (76 by 76 mm), pour height of 12 feet (3.6 m).

3.03 FIELD QUALITY CONTROL:

A. Qualified independent testing agency is to perform the following tests during construction for each 5000 sq. ft. (460 sq. m) of wall area or portion thereof:

1. Mortar Properties: ASTM C 270.
2. Mortar Composition and Properties: ASTM C 780.
3. Grout: ASTM C 1019.

3.04 IN-PROGRESS CLEANING:

A. Clean unit masonry as work progresses by dry brushing to remove mortar fins and smears prior to tooling joints.

B. During construction walls should be kept covered and clean in progress. All wall sections and units or pallets on the job site should be protected from splashing mud and other contaminants. Care should be taken in the handling of the units to minimize chipping from job site handling.

3.05 FINAL CLEANING:

A. After mortar is thoroughly set and cured, remove mortar particles with non-metallic scrapers, and clean exposed masonry as follows:

1. Test cleaning methods on sample wall panel; leave one-half of panel uncleaned for comparison purposes.
2. Protect adjacent surfaces from contact with cleaner.
3. Wet wall surfaces with water prior to application of cleaners; remove cleaners promptly by rinsing thoroughly with clear water.

4. Clean concrete masonry by cleaning method indicated in NCMA TEK 8-2 and as recommended by the manufacturer of ground face block.

5. Cleaning colored masonry:

a. Smooth Face Masonry Units: All Smooth Face colored units should be cleaned with an industrial strength masonry cleaner to remove any surface staining that may occur during production. (A diluted solution of Sure Klean Custom Masonry Cleaner may be used, but strict compliance with manufacturer's instructions is vital). This method of cleaning may alter the final appearance of the wall. A sample wall panel should be erected, cleaned with a high pressure fanned spray application and approved prior to construction.

3.06 MASONRY WASTE DISPOSAL:

A. Dispose of clean masonry waste, including broken masonry units, waste mortar, and excess or soil-contaminated sand, by crushing and mixing with fill material as fill is placed.

B. Do not dispose of masonry waste as fill within 18 inches (450 mm) of finished grade.

END OF SECTION 04 20 00

SECTION 04 73 00 - SIMULATED MANUFACTURED STONE (MANUFACTURED STONE VENEER AND TRIM)

PART 1 GENERAL

1.1 SUMMARY

A. Section includes: Simulated stone veneer and trim.

B. Related Sections: Section(s) related to this section include:
   1. Flashing: Division 7 Flashing Section.
   2. Perimeter Sealing at Openings: Division 7 Joint Sealers Section.

1.2 REFERENCES

A. General: Standards listed by reference, including revisions by issuing authority, form a part of this section to extent indicated. Standards listed are identified by issuing authority, authority abbreviation, designation number, title or other designation established by issuing authority.

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

   1. ASTM C39 Standard Specification for Compressive Strength of Cylindrical Concrete Specimens
   2. ASTM C91 Standard Specification for Masonry Cement.
   3. ASTM C150 Standard Specification for Portland cement
   4. ASTM C177 Standard Test Method for Steady-State Heat Flux Measurements and Thermal Transmission Properties by Means of the Guarded-Hot-Plate- Apparatus.
   5. ASTM C207 Standard Specification for Hydrated Lime for Masonry Purposes.
   6. ASTM C270 Standard Specification for Mortar for Unit Masonry
   7. ASTM C 482 Standard Test Method for Bond Strength of Ceramic Tile to Portland cement.
   8. ASTM C567 Standard Test Method for Density Structural Lightweight Concrete.
   9. ASTM C642 Standard Test Method Absorption in Hardened Concrete

1.3 SYSTEM DESCRIPTION

A. Performance Requirements: Provide Product which has been manufactured and installed to maintain performance criteria stated by manufacturer without defects, damage or failure.

1.4 SUBMITTALS

A. General: Submit listed submittals in accordance with conditions of the contract and Division 1 Submittal Procedures Section.
B. Product Data: Submit product data, including manufacturer's specifications sheet, for specified products.
C. Shop Drawings: Submit shop drawings showing layout, profiles and product components, including anchorage, accessories, finish colors, patterns and textures.
D. Samples: Submit selection and verification samples for finishes, colors and textures.
E. Quality Assurance Submittals: Submit the following:

   1. Test Reports: Certified test reports showing compliance with specified performance characteristics and physical properties.
   2. Manufacturer's Instructions: Manufacturer's installation instructions.

3. Manufacturer's Field Reports: Manufacturer's field reports specified herein.

F. Closeout Submittals: Submit the following:

1. Operation and Maintenance Data: Operation and maintenance data for installed products in accordance with Division 1 Closeout Submittals (Maintenance Data and Operation Data) Section. Include methods for maintaining installed products, and precautions against cleaning materials and methods detrimental to finishes and performance.
2. Warranty: Warranty documents specified herein.

1.5 QUALITY ASSURNACE

A. Qualifications:

1. Installer Qualifications: Installer experienced in installing simulated stone and has specialized in installation of work similar to that required for this project.
2. Manufacturer Qualifications: Manufacturer capable of providing field service representation during construction and approving application method.

1.6 DELIVERY, STORAGE, AND HANDLING

A. General: Comply with Division 1 Product Requirements Sections.
B. Ordering: Comply with manufacturer's ordering instructions and lead time requirements to avoid construction delays.
C. Delivery: Deliver materials in manufacturer's original, unopened, undamaged containers with identification labels intact.
D. Storage and Protection: Store materials protected from exposure to harmful weather conditions and at temperature and humidity conditions recommended by manufacturer. Store mortar and other moisture-sensitive materials in protected enclosures; handle by methods that avoid exposure to moisture.

1.7 PROJECT CONDITIONS

A. Environmental Requirements/Conditions: Ambient air temperature shall be in accordance with manufacturer's requirements.

1. Maintain materials and surrounding air temperature to minimum 40 degrees prior to, during and for 48 hours after completion of work.
2. Protect materials from rain, moisture and freezing temperatures prior to, during, and for 48 hours after completion of work.
3. Allow no construction activity on opposite side of wall during installation and for 48 hours after completion of work.

1.8 WARRANTY

A. Project Warranty: Refer to Conditions of the Contract for project warranty provisions.
B. Manufacturer's Warranty: Submit, for owner's acceptance, manufacturer's standard warranty document.

1. Warranty Period: Specify term in years commencing on date of project completion.

PART 2 PRODUCTS

2.1 MANUFACTURED STONE VENEER

A. Manufacturer: Glen-Gery Landmark Stone Products
P.O. Box 7276, Cynthiana, KY 41031;
Telephone: (866) 273-5214;
Or equal

B. Proprietary Products/Systems: Glen-Gery Landmark Stone Products

1. Sizes and Shapes: specify random shapes, sizes, and textures of finished. The average thickness of Landmark Stone veneers is 1 ¾". Thickness may vary from 1" to 3"depending on the texture.
2. Colors and Textures: As selected by owner.
3. Glen-Gery Natural Stone Texture:
   - Limestone: Color: Chisel Gray Limestone.
     Style: Manufactured Stone
4. Landmark Stone Accessories:
   - Water Table/Sill: Color as specified on Architectural Drawings
   - Trim Stone: Color as specified on Architectural Drawings
   - Row Lock: Color as specified on Architectural Drawings
   - Keystone: Color as specified on Architectural Drawings
   - Hearthstone: Color as specified on Architectural Drawings
   - Light Box: Color as specified on Architectural Drawings
   - Receptacle Box: Color as specified on Architectural Drawings

C. Proprietary Products System Testing:

1. Shipping weight of manufactured stone units: 8 – 12 psf
2. Compressive strength: Tested in accordance with ASTM C39.
3. Shear (Adhesion) strength: Tested in accordance with ASTM C482 using a unit thickness of approximately the same as the stone unit.
4. Thermal Resistance: K-Factor 2.82 in accordance with ASTM C177. R-factor is 0.355 per 1" (25.4mm) of thickness.
5. Freeze/Thaw: Tested in accordance with ASTM C67

D. Fire Hazard Test: Flame spread of 0. Smoke development of 0 in accordance with UL723.

2.2 RELATED MATERIALS

A. Related Materials: Refer to other sections listed in related sections specified herein for related materials

B. Mortar:

1. Portland Cement, ASTM C150, Type I or masonry cement (Type N), ASTM C91.
2. Masonry sand.
3. Lime: ASTM C207
4. Iron Oxide Pigments

C. Masonry Sealer:
   1. Acceptable Products – Acme Shield
   2. Submittals
      a. Spec-Data Sheet on Integral Water-Repellent Admixtures for Block and Mortar.
      b. Data Sheet on Mortar Admixture.
      c. Technical Bulletin on Cleaning Masonry Containing Integral Water-Repellant.
      d. Test Reports prepared by a qualified independent laboratory indicating compliance with the performance requirements for integral mortar water-repellency as tested using:
         i. ASTM E 514, extended to 72 hours.
         ii. ASTM C 1357.
         iii. ASTM C 1314.
         iv. ASTM C 1148.
   3. Sample Panel: Construct a sample panel to determine the compatibility of materials and the effect of the materials and construction procedures on the final appearance of the wall. Use jobsite materials, including specified water-repellent CMU and mortar to construct sample panel. The CMU sample panels erected shall represent the range of texture and color permitted for the project. Prepare more than one sample batch of mortar, especially when coloring pigments are added to the mortar, to establish desired aesthetics and performance. Perform all construction procedures on sample panel, including cleaning and application of coatings and sealants. Retain sample panel during construction as standard for judging completed masonry work. Acceptance of sample panel does not constitute approval of deviations from materials contained in sample panel, unless such deviations are specifically approved by Architect in writing.
   4. Site storage
      a. Store integral water-repellent mortar admixture in an area where temperature is maintained between 4°C (40°F) to 38°C (100°F).
      b. Do not allow integral water-repellent mortar admixture to freeze. Discard any frozen admixture.
   5. Warranty
      a. Integral water-repellent mortar admixture shall be warranted by admixture manufacturer to be free of defects to meet manufacturer's published physical and chemical properties.
      b. Installer shall warrant that only mortar containing integral water-repellant mortar admixture at the manufacturer's recommended addition has been placed in exterior walls.

D. Weather Resistant Barrier: Kraft waterproof building paper, UBC Standard No.14-1 or ASTM D226 for Type 1 felt.

E. Lath:

   1. Metal Lath: 18 gauge galvanized woven wire mesh or galvanized 2.5 lb flat diamond mesh

2.3 MORTAR MIXES

A. Mixing: Mix proprietary materials in accordance with manufacturer's instructions including product data and product technical bulletins. Thoroughly mix mortar ingredients in quantities needed for immediate use in accordance with ASTM C270, Type N. Do not use antifreeze compounds to lower the freezing point of mortar.

PART 3 EXECUTION

3.1 MANUFACTURER'S INSTRUCTIONS

A. Compliance: Comply with manufacturer's product data, including product technical data, and product installation instructions.

3.2 EXAMINATION

A. Site Verification of Conditions: Verify substrate conditions, which have been previously installed under other sections, are acceptable for products installation in accordance with manufacturer's instructions.

3.3 PREPARATION

A. Surface Preparation:

1. **Concrete and Masonry Surfaces - New, Clean and Untreated**: No preparation needed. Examine newly poured concrete closely to ensure that its finished surface contains no releasing agents (form oil). If it does contain form oil, etch surface with muriatic acid, rinse thoroughly and/or score with a wire brush, or use high pressure water or sandblasting to remove. For added insurance to minimize cracking or bond failure, lath and scratch coat can be applied.

2. **Existing Concrete and Masonry Surfaces**: If required, remove paint, coatings, sealers, and dirt as recommended above.

3.4 MANUFACTURED STONE VENEER INSTALLATION

A. Laying out the Stones: Before you begin, lay out a quantity of stone (25s.f. minimum) near the work area to give you a selection to choose from. When installing stone, be sure to achieve a balanced pattern of shapes, sizes, colors and thicknesses by selecting and mixing the various stones. Always select and mix stone from different boxes throughout installation.

B. Starting: Landmark Stone is applied from the top down. This helps to keep the stone clean during installation. Install the corners first for easiest fitting

C. Setting Units: Using a mason's trowel, apply a ½" thick even layer of mortar to the entire back of the stone. Press each stone into the mortar setting bed firmly enough to squeeze some mortar out around the stone's edges. Apply pressure to the stone to ensure a good bond.

D. Cutting: Perform necessary cutting with proper tools to provide uniform edges; take care to prevent breaking unit corners or edges.

E. Finish Color/Textures/Patterns: as selected by owner.

3.5 FIELD QUALITY REQUIREMENTS

A. Manufacturer's Field Services: Upon Owner's request, provide manufacturer's field service consisting of product use recommendations and periodic site visits for inspection of product installation in accordance with manufacturer's instructions.

3.6 CLEANING

- Cleaning: Use a strong solution of granulated soap or detergent and water with a plastic bristle brush. Do not use a wire brush as it will cause damage to the surface. Rinse immediately with fresh water. Do not attempt to clean using acid or acid based products. Do not clean with high-pressure power washer.

- Salt and De-icing Chemicals: Do not use de-icing chemicals on areas immediately adjacent to a Landmark Stone Products application.

- Scuffing: Remove scuff marks by cleaning as specified herein.

- Efflorescence: To remove efflorescence, allow stone to dry thoroughly, then scrub vigorously with a stiff brush and clean water. Rinse thoroughly. Do not use a wire brush. For difficult efflorescence problems, scrub thoroughly with a solution of 1 part white household vinegar to 5 parts water. Rinse thoroughly.

PROTECTION

Protection: Protect installed product and finish surfaces from damage during construction.

END OF SECTION

Glen-Gery

Chisel Gray Limestone

Save Product Compare Stone

Where To Buy Contact Us

See this on your house

Product Information:

Brand: Glen-Gery

Type: Manufactured Stone

Color: Chisel Gray

Style: Manufactured Stone

Plant: Landmark

SECTION 06 10 00 - MISCELLANEOUS CARPENTRY

PART 1- GENERAL

1.01 RELATED DOCUMENTS:

A. All applicable portions of Division 1 - General Requirements are to be considered as included with this Section.

B. The following are minimum requirements and shall govern, except that all Federal, Local and/or State Codes and Ordinances shall govern when their requirements are in excess hereof.

1.02 SUMMARY:

A. This Section includes the following:

1. Wood nailers and blocking.
2. Plywood sheathing.

1.03 QUALITY ASSURANCE:

A. Comply with all applicable standards for all wood and wood related products, including applicable codes.

PART 2 - PRODUCTS

2.01 LUMBER, GENERAL:

A. Furnish grade stamped lumber that is dressed S4S and complies with PS 20 and applicable grading rules of inspection agencies certified by ALSC's Board of Review.

1. Provide seasoned lumber with 19 percent moisture content for sizes 2 inches or less in thickness.

2.02 DIMENSION LUMBER:

A. Provide lumber of the following product classification in grade and species indicated:

B. For nailers and blocking provide "Standard" grade lumber.

C. Any species rated structural lumber.

2.03 CONSTRUCTION PANELS:

A. For types of concealed applications indicated below, provide panels that are factory marked with APA trademark and that comply with PS 1 for plywood products or with "APA" PRP-108 for other construction panels. ***The size and spacing/quantity of fasteners connecting all wood members in accordance with Table 2304.9.1.***

B. Roof Sheathing: APA rated sheathing, CD - exterior exposure.

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2.04 FASTENERS:

A. Provide hot-dip zinc-coated fasteners per ASTM A 153 or AISI Type 304 stainless steel fasteners.

B. Power Driven Fasteners: National Evaluation Report NER-272.

C. Wood and Sheet Metal Screws: ANSI B18.6.1.

D. Lag Bolts: ANSI B18.2.1.

E. Bolts: Steel bolts complying with ASTM A 307, Grade A; with ASTM A 563 hex nuts and where indicated, flat washers.

F. Fasteners Gypsum Sheathing: 1-1/4" minimum, No. 6, Type S or S-12 wafer or bugle head self-tapping corrosion resistant screws.

2.05 METAL FRAMING ANCHORS:

A. Provide metal framing anchors of type, size, metal, and finish indicated that comply with requirements specified including the following:

1. Current Evaluation/Research Reports: Provide products for which model code evaluation/research reports exist that are acceptable to authorities having jurisdiction and that evidence compliance of metal framing anchors for application indicated with the building code in effect for this Project.

2.06 PRESERVATIVE PRESSURE TREATED LUMBER AND PLYWOOD:

A. Preservative pressure treat lumber and plywood with water-borne preservatives to comply with AWPA C2 and C9, respectively, and with requirements indicated blow. Mark each treated item with the AWPB or SPIB Quality Mark Requirements.

1. Wood nailers, blocking, plywood, and similar members in connection with roofing and flashing.

2.07 FIRE RETARDANT TREATED MATERIALS:

A. Comply with applicable requirements of AWPA C20 (lumber) and AWPA C27 (plywood). Identify fire-retardant treated lumber with appropriate classification marking of UL; U.S. Testing; ***The FRT plywood shall meet the fire-retardant-treated wood test standards in accordance with Section 2303.2 and the labeling requirements in accordance with Section 2303.2.1. The strength adjustments are in accordance with Section 2303.2.2.1.*** Timber Products Inspection, Inc.; or other acceptable inspection agency.

1. For interior location, use chemical formulation that produces treated lumber and plywood with properties for bending stiffeners and fastener holding capacities are not reduced below published values by manufacturer of chemical formulation under elevated temperature and humidity conditions by a qualified independent testing agency.

2.08 FRX TREATED LUMBER AND PLYWOOD:

A. Product Identification:

1. All lumber and plywood designated to be exterior fire retardant treated shall be pressure impregnated with FRX chemicals and shall have a flame spread rating of 25 or less when tested in accordance with ASTM E-84, "Standard Test Method for Surface Burning Characteristics of Building Materials." Also, when test conditions are extended to 30 minutes, the flame spread should not progress more than 10 1/2 feet beyond the centerline of the burners, with no evidence
of significant progressive combustion.

2. Each piece of fire retardant treated lumber and plywood shall be manufactured under independent third party follow-up inspection service, and each piece shall bear the appropriate qualified inspection agency's label indicating surface burning characteristics in the 30 minute ASTM E-84 flame spread test. Each piece will be labeled indicating kiln dried after treatment (KDAT) and identifying the treating company and location.

3. In addition, there shall be no increase in the listed classification when tested after ASTM D-2898 "Standard Method of Accelerated Weathering of Fire Retardant Treated Wood for Fire Testing."

B. Lumber: Provide lumber of the appropriate grade and species as specified by the design criteria for the intended application.

C. Plywood: Provide plywood of the appropriate grade and species as specified by the design criteria for the intended application.

D. Fire Retardant Treatment:

1. Treatment shall be FRX chemicals manufactured by Chemco Acquisition, Ferndale, WA.
2. All exterior fire retardant treated wood shall be kiln dried after treatment to a moisture content of 19% for lumber and 15% for plywood.
3. Kiln drying after treatment shall be monitored by an approved third party agency, and the identification label on each piece of wood will so indicate.
4. The fire retardant formulation must be free of halogens, sulfates, chlorides and ammonium phosphate.

E. Field Cuts: Do not rip or mill FRX fire retardant treated lumber. End cuts, drilling holes and joining cuts are permitted. Plywood may be cut in any direction.

F. Application: FRX fire retardant treated lumber and plywood used in structural applications shall be applied according to strength tables provided by Arch Wood Protection.

G. FRX is a non-leachable fire retardant treatment and may be installed with direct exposure to precipitation, however, it cannot be substituted for preservative treated wood.

H. FRX wood shall not be used in enclosed roofing applications.

I. FRX wood shall not be used in direct contact with the ground.

J. Exterior fire retardant treated lumber and plywood shall use design value adjustments and span ratings as published by Arch Wood Protection.

PART 3 - EXECUTION

3.01 INSTALLATION:

A. Install rough carpentry work to comply with N.F.P.A. "Manual for Wood Framing Construction", Form E30-"APA Design/Construction Guide - Residential & Commercial", and the following:

1. Recommendations of manufacturer of sheathing, underlayment and other products not covered in above publications.

B. Set rough carpentry to required levels and lines, with members plumb and true and cut to fit.

C. Provide wood members of size and type indicated.

D. Securely attach carpentry work to substrates with anchor bolts built into masonry and to steel members using 1/2" bolts and countersunk. Space bolts 32" o.c.

E. Cut sheathing around structural framing to fit tight for an air-tight closure.

F. Secure nailer to anchor bolts.

G. Place edges of sheathing to align with center of studs. Secure sheathing with countersunk type non-corrosive screws spaced at 8" o.c. at perimeter at in field.

H. Bevel cast sheathing edges at intersections.

3.02 INSTALLATION CONSTRUCTION PANELS:

A. Comply with applicable recommendations contained in APA Form No. E 30, "APA Design/Construction Guide Residential and Commercial" for types of structural use panels and applications. Comply with "Code Plus" provisions of above reference guide.

END OF SECTION 06 10 50

SECTION 07 46 00 SIDING

PART 1 - GENERAL

1.01 SECTION INCLUDES

A Primed for paint fiber cement lap siding, panels, single, trim, fascia, moulding and accessories, James Hardie HZ5 Engineered for Climate Siding.

1.02 REFERENCES

A ASTM C1186 - Standard Specification for Flat Fiber-Cement Sheets

B ASTM D3359 - Standard Test Method for Measuring Adhesion by Tape Test, Tool and Tape.

C ASTM E136 - Standard Test Method for Behavior of Materials in a Vertical Tube Furnace at 750 degrees C.

1.03 SUBMITTALS

A Submit under provisions of Section 01300.

B Product Data: Manufacturer's data sheets on each product to be used, including:
1. Preparation instructions and recommendations.
2. Storage and handling requirements and recommendations.
3. Installation methods.

C Shop Drawings: Provide detailed drawings of atypical non-standard applications of cementitious siding materials which are outside the scope of the standard details and specifications provided by the manufacturer.

D Verification Samples: For each finish product specified, two samples, minimum size 4 by 6 inches (100 by 150 mm), representing actual product, color, and patterns.

1.04 QUALITY ASSURANCE

A Installer Qualifications: Minimum of 2 years experience with installation of similar products.

1.05 DELIVERY, STORAGE, AND HANDLING

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

B Store siding on edge or lay flat on a smooth level surface. Protect edges and corners from chipping. Store sheets under cover and keep dry prior to installing.

C Store and dispose of solvent-based materials, and materials used with solvent-based materials, in accordance with requirements of local authorities having jurisdiction.

1.05 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.

1.06 WARRANTY

A Product Warranty: Limited, non-pro-rated product warranty.
1. HardiePlank HZ5 lap siding for 30 years.

B Workmanship Warranty: Application limited warranty for 2 years.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A Acceptable Manufacturer: James Hardie Building Products, Inc., which is located at: 26300 La Alameda Suite 400 ; Mission Viejo, CA 92691; Toll Free Tel: 866-274-3464; Tel: 949-367-4980; Email: request info (info@jameshardie.com); Web: www.jameshardiecommercial.com

B Requests for approval of equal substitutions will be considered.

2.02 SIDING

A Lap Siding: HardiePlank HZ5 Lap siding as manufactured by James Hardie Building Products, Inc.
1. Type: Smooth primed for paint 5-1/4 inches with 4 inches exposure.

2.03 FASTENERS

A Wood Framing: No. 11 gauge 1-3/4 inches (44 mm) corrosion resistant roofing nails.

2.04 FINISHES

A Factory Finish: Provide factory applied universal primer.

1. Primer: Factory primed by James Hardie.

2. Topcoat: Refer to Section 09900 and Exterior Finish Schedule. Match existing building

PART 3 EXECUTION

3.01 EXAMINATION

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

B If framing preparation is the responsibility of another installer, notify Architect of unsatisfactory preparation before proceeding.

C Examine existing substrate condition and make any required repairs required, including adding the use of water-resistive barriers and rainscreen mesh mat.
1. Install water-resistive barriers and claddings to dry surfaces.
2. Repair any punctures or tears in the water-resistive barrier prior to the installation of the siding.
3. Protect siding from other trades.

3.02 PREPARATION

A Clean surfaces thoroughly prior to installation.

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

C Install a water-resistive barrier is required in accordance with local building code requirements.

D The water-resistive barrier must be appropriately installed with penetration and junction flashing in accordance with local building code requirements.

E Install weather barrier in accordance with local building code requirements.

F Use weather barrier Seam Tape and joint and laps.

G Install weather barrier flashing, and weather barrier Flex Flashing

3.03 INSTALLATION - HARDIEPLANK HZ5 LAP SIDING

A Install materials in strict accordance with manufacturer's installation instructions.

B Starting: Install a minimum 1/4 inch (6 mm) thick lath starter strip at the bottom course of the wall. Apply planks horizontally with minimum 1-1/4 inches (32 mm) wide laps at the top. The bottom edge of the first plank overlaps the starter strip.

C Allow minimum vertical clearance between the edge of siding and any other material in strict accordance with the manufacturer's installation instructions.

D Align vertical joints of the planks over framing members.

E Maintain clearance between siding and adjacent finished grade.

F Locate splices at least one stud cavity away from window and door openings.

G Wind Resistance: Where a specified level of wind resistance is required Hardieplank lap siding is installed to framing members and secured with fasteners described in Table No. 2 in National Evaluation Service Report No. NER-405.

H Locate splices at least 12 inches (305 mm) away from window and door openings.

3.04 FINISHING

A Finish factory primed siding with a minimum of one coat of high quality 100 percent acrylic or latex or oil based exterior grade paint within 180 days of installation. Follow paint manufacturer's written product recommendation and written application instructions.

3.05 PROTECTION

A Protect installed products until completion of project.

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

END OF SECTION

SECTION 07 90 10 - JOINT SEALANTS

PART 1 - GENERAL

1.01 RELATED DOCUMENTS:

A. All applicable portions of Division 1 - General Requirements are to be considered as included with this Section.

B. The following are minimum requirements and shall govern except that all Federal, Local, and/or State Codes and Ordinances shall govern when their requirements are in excess hereof.

1.02 SUMMARY:

A. This Section includes joint sealants for the following locations:

1. Exterior joints in wall surfaces as indicated below:

   a. Control joints in masonry.
   b. Joints between aluminum and steel and masonry.
   c. Expansion joints in sidewalks and paving.
   d. Joints between metals, joints in custom wall panels specified elsewhere.
   e. Other exterior joints where indicated.

2. Interior joins surfaces as indicated below:

   a. Perimeter of metal frames and masonry and gypsum wallboard.
   b. Joints between windows and stools.
   c. Control joints.
   d. Between steel and masonry.
   e. Other joints as indicated.
   f. Joints in tile work.

1.03 SYSTEM PERFORMANCE REQUIREMENTS:

A. Provide elastomeric joint sealants that have been produced and installed to establish and to maintain watertight and airtight continuous seals without causing staining or deterioration of joint substrates.

1.04 SUBMITTALS:

A. The Contractor shall check and approve all shop drawings and letters of intent for conformance with the Contract Documents prior to forwarding to the Architect for his review.

B. If information on the shop drawings differs in any way from the contract plans and specifications, the Contractor must submit a letter along with the shop drawings highlighting the difference and explaining why he did it. If the differences are not highlighted or brought to the attention of the Architect, the Architect's review of the shop drawings will not be construed to be approval of the difference.

C. Upon completion of the Architect's review, the Architect shall distribute the reviewed shop drawings to the Contractor except as noted below. Only those shop drawings noted to be "Reviewed" or "Furnish as Corrected" will be permitted for use at the project site

D. General: Submit the following in accordance with Conditions of Contract and Division 1 Specification Sections.

1. Product data from manufacturers for each joint sealant product required.

2. Certification by joint sealant manufacturer that sealants plus the primers and cleaners required for sealant installation comply with local regulations controlling use of volatile organic compounds.

3. Samples for initial selection purposes in form of manufacturer's standard bead samples, consisting of strips of actual products showing full range of colors available, for each product exposed to view.

4. Certificates from manufacturers of joint sealant attesting that their products comply with specification requirements and are suitable for the use indicated.

5. Product test reports for each type of joint sealants indicated, evidencing compliance with requirements specified.

6. Preconstruction field test reports indicating which products and joint preparation methods demonstrate acceptable adhesion to joint substrates.

1.05 QUALITY ASSURANCE:

A. Installer Qualifications: Engage an experienced installer who has completed joint sealant applications similar tin material, design, and extent to that indicated for Project that have resulted in construction with a record of successful in-service performance.

B. Single Source Responsibility for Joint Sealant Materials: Obtain joint sealant materials from a single manufacturer for each different product required.

C. Preconstruction Joint Sealant-Substrate Tests: Submit substrate materials representative of actual joint surfaces to joint sealant manufacturer for laboratory testing of joint sealants for adhesion to primed and unprimed substrates and for compatibility with joint substrates and other joint-related materials.

1.06 DELIVERY, STORAGE, AND HANDLING:

A. Deliver materials to Project site in original unopened containers or bundles with labels indicating manufacturer, product name and designation, color, expiration period for use, pot life, curing time, and mixing instructions for multi-component materials.

B. Store and handle materials in compliance with manufacturer's recommendations to prevent their deterioration or damage due to moisture, high or low temperatures, contaminants, or other causes.

1.07 PRODUCT CONDITIONS:

A. Environmental Conditions: Do not proceed with installation of joint sealants under the following conditions.

B. When ambient and substrate temperature conditions are outside the limits permitted by joint sealant manufacturer or below 40 degrees F. (4.4 degrees C).

C. When joint substrates are wet.

D. Joint Width Conditions: Do not proceed with installation of joint sealants where joint widths are less than allowed by joint sealant manufacturer for application indicated.

E. Joint Substrate Conditions: Do not proceed with installation of joint sealants until contaminants capable of interfering with their adhesion are removed from joint substrates.

PART 2 - PRODUCTS

2.01 MATERIALS, GENERAL:

A. Latex Joint Sealants:

1. Acrylic-Emulsion Sealant: Manufacturer's standard one part, non-sag, mildew-resistant, acrylic-emulsion sealant complying with ASTM C 834, formulated to be paintable and recommended for exposed applications on interior.

2. Products: Subject to compliance with requirements, provide one of the following:

a. AC-20; Pecora Corporation.
b. Sonolac; Sonneborn Building Products Division.
c. Tremco Acrylic Latex 834, Tremco Inc.

3. Use for exposed interior wall joints.

B. Elastomeric Sealants:

1. Silicone Sealant:

a. One part silicone sealant complying with ASTM C 290, Type S, Grade NS, Class 25. Use M, G, A, O.

b. Subject to compliance with requirements, provide one of the following:

1.) Dow Corning 795.
2.) General Electric Ultraglaze 4200.

c. Use for joints between aluminum and masonry and metal.

2. Low modulas high performance polyurethane sealant:

   a. Uses NT, M, G, O.

   b. Provide subject to compliance with the requirements:

      1.) Sonolastic SL2; Sonneborn Building Products Division.
      2.) Dynatrol II; Pecora Corporation.
      3.) Permapol II; Products Research & Chemical Corporation.
      4.) Dymeric; Tremco, Inc.

   c. Use for joints between masonry and masonry, and masonry and steel.

3. Multi-Part Non-Sag Urethane Sealant for Use T: Type M, Grade NS< Class 25; Uses T, M, G, A, and, as applicable to joint substrates indicated, O.

   a. Products: Subject to compliance with requirements, provide one of the following:

      1.) Vulken 922; Mameco Corporation.
      2.) Dynatred, Pecora Corporation.
      3.) Permapol RC-270; Products Research & Chemical Corporation.
      4.) Silkaflex 2C NS; Sika Corporation.
      5.) Sonolastic NP2; Sonneborn Building Products Division.

   b. User for flooring joints subject to traffic.

4. One part silicone sealant for use around non porous surfaces in toilets where high humidity and temperature conditions exist: Type S, Grade NS, Class 25, Use NT, G, A, O.

   a. Products: Subject to compliance with requirements provide one of the following:

      1.) 786 Mildew Resistant Silicone Sealant; Dow Corning.
      2.) Sanitary 1700; GE Silicones.

   b. Use for joints in tile work, toilet fixtures, and tile or masonry.

2.02 JOINT SEALANT BACKING:

A. General: Provide sealant backings of material and type that are nonstaining; are compatible with joint substrates, sealants, primers and other joint fillers; and are approved for applications indicated by sealant manufacturer based on field experience and laboratory testing.

B. Plastic Foam Joint Fillers: Preformed, compressible, resilient, nonstaining, non-waxing,, non-extruding strips of flexible plastic foam of material indicated below and of size, shape and density to control sealant depth and otherwise contribute to producing optimum sealant performance.

C. Proprietary, reticulated, closed-cell polymeric foam, non-outgassing, with a density of 2.5 pcf and tensile strength of 35 psi per ASTM D 1623, and with water absorption less than 0.02 gms/cc per ASTM C 1083.

D. Elastomeric Tubing Joint Fillers: Neoprene, butyl, EPDM, or silicone tubing complying with ASTM D 1056, nonabsorbent to water and gas, capable of remaining resilient at temperatures down to 26 degrees F (-32 degrees C). Provide products with low compression set and of size and shape to provide a secondary seal, to control sealant depth, and otherwise contribute to optimum sealant performance.

E. Bond-Breaker Tape: Polyethylene tape or other plastic tape as recommended by sealant manufacturer for preventing sealant from adhering to rigid, inflexible joint filler materials or joint surfaces at back of joint where such adhesion would result in sealant failure. Provide self-adhesive tape where applicable.

2.03 MISCELLANEOUS MATERIALS:

A. Primer: Material recommended by joint sealant manufacture where required for adhesion of sealant to joint substrates indicated, as determined from preconstruction joint sealant-substrate tests and field tests.

B. Cleaners for Nonporous Surfaces: Chemical cleaners acceptable to manufacturers of sealants and sealant backing materials free of oily residues or other substances capable of staining or harming in any way joint substrates and adjacent nonporous surfaces, and formulated to promote optimum adhesion of sealants with joint substrates.

C. Masking Tape: Nonstaining, nonabsorbent material compatible with joint sealants and surfaces adjacent to joints.

PART 3 - EXECUTION

3.01 EXAMINATION:

A. Examine joints indicated to receive joint sealants, with Installer present, for compliance with requirements for joint configuration, installation and other tolerances, and other conditions affecting joint sealant performance. Do not proceed with installation of joint sealants until unsatisfactory conditions have been corrected.

B. Latex Sealant Installation Standard: Comply with requirements of ASTm C 90 for use of latex sealants.

C. Install joint fillers of type indicated to provide support of sealants during application and at position required to produce the cross-sectional shapes and depths of installed sealants relative to joint widths that allow optimum sealant movement capability.

1. Do not lease gaps between ends of joint fillers.

2. Do not stretch, twist, puncture, or tear joint fillers.

3. Install bond breaker tape between sealants where backer rods are not used between sealants and joint fillers or back of joints.

4. Install precompressed joint seal with face in line with face of masonry and installed in accordance with manufacturer's written instructions.

D. Installation of Sealants: Install sealants by proven techniques that result in sealants directly contacting and fully wetting joint substrates, completely filling recesses provided for each joint configuration, and providing uniform, cross-sectional shapes and depths relative to joint widths that allow optimum sealant movement capability. Install sealants at the same time sealant backings are installed.

E. Tooling of Non-Sag Sealants: Immediately after sealant application and prior to time skinning or curing begins, tool sealants to form smooth, uniform beads of configuration indicated, to eliminate air pockets, and to ensure contact and adhesion of sealant with sides of joint. Remove excess sealants from surfaces adjacent to joint. Do not use tooling agents that discolor sealant or adjacent surfaces or are not approved by sealant manufacturer.

1. Provide recessed joint configuration, per Figure 5C in ASTM C 962, of recess depth and at locations indicated.

3.02 PREPARATION:

A. Surface Cleaning of Joints: Clean out joints immediately before installing joint sealant to comply with recommendations of joint sealant manufacturer and the following requirements:

1. Remove all foreign material from joint substrates that could interfere with adhesion of joint sealant, including dust, paints (except for permanent, protective coatings tested and approved for sealant adhesion and compatibility by sealant manufacturer), old joint sealants, oil, grease, waterproofing, water repellents, water surface dirt, and frost.

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

3. Remove laitance and form release agents from concrete.

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

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

3.03 INSTALLATION OF JOINT SEALANTS:

A. General: Comply with joint sealant manufacturer's printed installation instructions applicable to products and applications indicated, except where more stringent requirements apply.

B. Elastomeric Sealant Installation Standard: Comply with recommendations of ASTM C 962 for use of joint sealant as applicable to materials, applications, and conditions indicated.

3.04 CLEANING:

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

3.05 PROTECTION:

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

END OF SECTION 07 90 10

SECTION 09 90 00 PAINTING

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Interior and exterior painting, including surface preparation for projects in the United States.

1.2 REFERENCES

A. Green Seal Standard GS-11; May 20, 1993.

B. Occupational Safety and Health Act (OSHA) - Safety Standards.

C. American National Standards Institute (ANSI) - Performance Standards.

D. Paint Decorating Contractors of America (PDCA) - Application Standard.

E. National Paint and Coatings Association (NPCA) - Gloss Standard.

F. American Society for Testing Materials (ASTM) - Testing Methods.

G. Master Paint Institute (MPI #) - Established paint categories and standards.

H. Ozone Transmission Commission (OTC) - Established levels of Volatile Organic Compounds.

I. SCAQMD 1168 - South Coast Air Quality Management District Rule #1168; October 3, 2003.

J. SSPC (PM1) - Steel Structures Painting Manual, Vol. 1, Good Painting Practice; Society for Protective Coatings; 1993, Third Edition.

K. SSPC (PM2) - Steel Structures Painting Manual, Vol. 2, Systems and Specifications; Society for Protective Coatings; 1995, Seventh Edition.

L. 40 CFR 59, Subpart D - National Volatile Organic Compound Emission Standards for Architectural Coatings; U.S. Environmental Protection Agency; current edition.

1.3 DEFINITIONS

A. Commercial as used in this Section refers to a product well suited for a commercial application.

B. DFT as used in this Section refers to the Dry Film Thickness of the coating.

C. Enamel refers to any acrylic or alkyd (oil) base paint which dries leaving an eggshell, pearl, satin, semi-gloss or high gloss enamel finish.

D. DTM as used in this Section refers to paint that is applied Direct To Metal.

E. LEED as used in this Section refers to Leadership in Energy and Environmental Design. Products listed meet LEED criteria for environmentally safe interior primers, paints and coatings.

F. OTC as used in this Section refers to the Ozone Transmission Commission. OTC has established the following VOC levels for the Northeastern United States. Products shall meet

the following OTC limits for VOC's.

1. Interior flat paints: 100 grams per liter or less, per gallon.
2. Interior enamels: 150 grams per liter or less, per gallon.
3. Interior stains: 250 grams per liter or less, per gallon.
4. Interior primers: 200 grams per liter or less, per gallon.
5. Rust preventive coatings: 400 grams per liter or less, per gallon.
6. Dry fog coatings: 400 grams per liter or less, per gallon.
7. Floor coatings: 250 grams per liter or less, per gallon.

G. Premium as used in this Section refers to the best quality product "top of the line".

H. VOC as used in this Section refers to Volatile Organic Compounds found in primers, paints, sealers and stains. The level of VOCs appears after each product listed in the Schedule in grams per liter (g/L).

I. Paints are available in a wide range of sheens or glosses, as measured by a gloss meter from a 60 and/or 85 degree angle from vertical, as a percentage of the amount of light that is reflected. The following terms are used to describe the gloss of our products. The list below is provided for general guidance; refer to the technical data sheet for the actual gloss/sheen level for each product.

1. Flat - Less than 5 Percent.
2. Eggshell - 5 - 20 Percent.
3. Satin - 20 - 35 Percent.
4. Semi-Gloss - 30 - 65 Percent.
5. Gloss - Over 65 Percent.

1.4 SUBMITTALS

A. Submit under provisions of Section 01300 - Administrative Requirements.

B. Product Data: Provide a complete list of all products to be used, with the following information for each:

1. Manufacturer's name, product name and/or catalog number, and general product category.
2. Cross-reference to specified paint system(s) that the product is to be used in; include description of each system.

C. Samples: Submit three paper samples, 5 inches by 7 inches (127mm x 178mm) in size, illustrating selected colors for each color and system selected with specified coats cascaded.

D. Manufacturer's Instructions: Indicate special surface preparation procedures.

E. Maintenance Data: Submit data on cleaning, touch-up, and repair of painted and coated surfaces.

1.5 QUALITY ASSURANCE

A. Manufacturer Qualifications: All primary products specified in this section will be supplied by a single manufacturer with a minimum of ten years experience.

B. Installer Qualifications: All products listed in this section are to be applied by a Painting Contractor with a minimum of five years demonstrated experience in surface preparation and field application of the same type and scope as specified.

1.6 DELIVERY, STORAGE, AND HANDLING

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

B. Store and dispose of solvent-based materials, and materials used with solvent-based materials, in accordance with requirements of local authorities having jurisdiction.

C. Disposal:
   1. Never pour leftover coating down any sink or drain. Use up material on the job or seal can and store safely for future use.
   2. Do not incinerate closed containers.
   3. For specific disposal or recycle guidelines, contact the local waste management agency or district. Recycle whenever possible.

1.7 PROJECT CONDITIONS

A. Maintain environmental conditions (temperature, humidity, and ventilation) within limits recommended by manufacturer for optimum results. Do not install products under environmental conditions outside manufacturer's recommended limits.

1.8 WARRANTY

A. Inspection of all surfaces to be coated must be done by the manufacturer's representative to insure proper preparation prior to application. All thinners, fillers, primers and finish coatings shall be from the same manufacturer to support a product warranty. Products other than those submitted shall be accompanied by a letter stating its fitness for use and compatibility.

B. At project closeout, provide to the Owner or owner's representative an executed copy of the Manufacturer's standard form outlining the terms and conditions of and any exclusions to their Limited Warranty against Manufacturing Defect.

1.9 EXTRA MATERIALS

A. At project closeout, supply the Owner or owner's representative one gallon of each product for touch-up purposes. Cans shall be clearly marked with color name, number and type of paint.

B. At project closeout, provide the color mixture name and code to the Owner or owner's representative for accurate future color matching.

PART 2 PRODUCTS

2.1 MANUFACTURERS

A. Acceptable Manufacturer: Benjamin Moore and Co., which is located at: 101 Paragon Dr ; Montvale, NJ 07645; Toll Free Tel: 866-708-9181; Email: info@benjaminmoore.com; Web:www.benjaminmoore.com

B. Substitutions: Coronado Paint Company.

2.2 MATERIALS - GENERAL

A. Volatile Organic Compound (VOC) Content:
   1. Provide coatings that comply with the most stringent requirements specified in the following:
      a. 40 CFR 59, Subpart D-National Volatile Organic Compound Emission Standards for Architectural Coatings.
      b. Determination of VOC Content: Testing and calculation in accordance with 40 CFR 59, Subpart D (EPA Method 24), exclusive of colorants added to a tint base and water added at project site; or other method acceptable to authorities having jurisdiction.

B. Compatibility: Provide materials that are compatible with one another and the substrates indicated under conditions of service and application, as demonstrated by manufacturer based on testing and field experience.

2.3 MIXING AND TINTING

A. Except where specifically noted in this section, all paint shall be ready-mixed and pre-tinted. Agitate all paint prior to and during application to ensure uniform color, gloss, and consistency.

B. Thinner addition shall not exceed manufacturer's printed recommendations. Do not use kerosene or other organic solvents to thin water-based paints.

2.4 EXTERIOR PAINT SYSTEMS

A. CONCRETE (Cementitious Siding, Flexboard, Transite Board, Shingles (Non-Roof), Common Brick, Stucco, Tilt-up, Precast, and Poured-in-place Cement).
   1. Latex Systems:
      a. Satin Finish:
         1) 1st Coat: Benjamin Moore Super Spec® Interior/Exterior Acrylic High Build Masonry Primer N068 (97g/L), MPI # 3, LEED 2009.
         2) 2nd Coat: Benjamin Moore Ultra Spec EXT Satin N448 (46 g/L), MPI # 15.
         3) 3rd Coat: Benjamin Moore Ultra Spec EXT Satin N448 (46 g/L), MPI # 15.

B. MASONRY: Concrete Masonry Units (CMU) - Cinder or Concrete Block.
   1. Latex Systems:
      a. Satin Finish:
         1) 1st Coat: Coronado Super Kote 5000 Production Block Filler 958-11 (35 g/L), MPI # 4, X-Green 4, LEED V4, CHPS Certified.
         2) 2nd Coat: Coronado Cryli Cote 100% Acrylic Satin House & Trim Paint 410 (83 g/L).
         3) 3rd Coat: Coronado Cryli Cote 100% Acrylic Satin House & Trim Paint 410 (83 g/L).

C. METAL: Aluminum, Galvanized.
   a. Satin Finish:
      1) 1st Coat: Benjamin Moore Ultra Spec EXT Satin N448 (46 g/L), MPI # 15.
      2) 2nd Coat: Benjamin Moore Ultra Spec EXT Satin N448 (46 g/L), MPI # 15.

D. WOOD: Siding, Trim, Shutters, Sashes, Hardboard-Bare/Primed.
   1. Latex Systems:
      a. Satin Finish:
         1) 1st Coat: Benjamin Moore Fresh Start High-Hiding All Purpose Primer 046 (44 g/L), MPI # 6, 17, X-Green 17, 39, 50, X-Green 50, 137, XGreen 137, LEED Credit, CHPS Certified.
         2) 2nd Coat: Benjamin Moore Ultra Spec EXT Satin N448 (46 g/L), MPI # 15
         3) 3rd Coat: Benjamin Moore Ultra Spec EXT Satin N448 (46 g/L), MPI # 15

PART 3 EXECUTION

3.1 EXAMINATION

A. The Contractor shall review the product manufacturer's special instructions for surface preparation, application, temperature, re-coat times, and product limitations.

B. The Contractor shall review product health and safety precautions listed by the manufacturer.

C. The Contractor shall be responsible for enforcing on site health and safety requirements associated with the Work.

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

E. Ensure that surfaces to receive paint are dry immediately prior to application.

F. Ensure that moisture-retaining substrates to receive paint have moisture content within tolerances allowed by coating manufacturer. Where exceeding the following values, promptly notify Architect and obtain direction before beginning work.
   1. Concrete and Masonry: 3-5 percent. Allow new concrete to cure a minimum of 28 days.
   2. Exterior Wood: 17 percent.
   3. Interior Wood: 15 percent.
   4. Interior Finish Detail Woodwork, Including Trim, and Casework: 10 percent.
   5. Plaster and Gypsum: 15 percent.
   6. Concrete Slab-On-Grade: Perform calcium chloride test over 24 hour period or other acceptable test to manufacturer. Verify acceptable moisture transmission and pH levels.

G. Examine surfaces to receive coatings for surface imperfections and contaminants that could impair performance or appearance of coatings, including but not limited to, loose primer, rust, scale, oil, grease, mildew, algae, or fungus, stains or marks, cracks, indentations, or abrasions.

H. Correct conditions that could impair performance or appearance of coatings in accordance with specified surface preparation procedures before proceeding with coating application.

3.2 PREPARATION - GENERAL

A. Clean surfaces thoroughly prior to coating application.

B. Do not start work until surfaces to be finished are in proper condition to produce finished surfaces of uniform, satisfactory appearance.

C. Stains and Marks: Remove completely, if possible, using materials and methods recommended by coating manufacturer; cover stains and marks which cannot be completely removed with isolating primer or sealer recommended by coating manufacturer to prevent bleed-through.

D. Remove Mildew, Algae, and Fungus using materials and methods recommended by coating manufacturer.

E. Remove dust and loose particulate matter from surfaces to receive coatings immediately prior to coating application.

F. Remove or protect adjacent hardware, electrical equipment plates, mechanical grilles and louvers, lighting fixture trim, and other items not indicated to receive coatings.

G. Move or protect equipment and fixtures adjacent to surfaces indicated to receive coatings to allow application of coatings.

H. Protect adjacent surfaces not indicated to receive coatings.

I. Prepare surfaces in accordance with manufacturer's instructions for specified coatings and indicated materials, using only methods and materials recommended by coating manufacturer.

3.3 SURFACE PREPARATION

A. Concrete and Concrete Masonry: Clean surfaces free of loose particles, sand, efflorescence, laitance, form oil, curing compounds, and other substances which could impair coating performance or appearance.

B. Concrete Floors: Remove contaminants which could impair coating performance or appearance. Verify moisture transmission and alkaline-acid balance recommended by coating manufacturer; mechanically abrade surface to achieve 80-100 grit medium-sandpaper texture.

C. Existing Coatings:
   1. Remove surface irregularities by scraping or sanding to produce uniform substrate for coating application; apply one coat primer of type recommended by coating manufacturer for maximum coating adhesion.
   2. If presence of lead in existing coatings is suspected, cease surface preparation and notify Architect immediately.

D. Gypsum Board: Repair cracks, holes and other surface defects with joint compound to produce surface flush with adjacent surfaces.

E. Masonry Surfaces - Restored: Remove loose particles, sand, efflorescence, laitance, cleaning compounds and other substances that could impair coating performance or appearance.

F. Metals - Aluminum, Mill-Finish: Clean and etch surfaces with a phosphoric acid-water solution or water based industrial cleaner. Flush with clean water and allow to dry, before applying primer coat.

G. Metals - Copper: Clean surfaces with pressurized steam, pressurized water, or solvent washing.

H. Metals - Ferrous, Unprimed: Remove rust or scale, if present, by wire brush cleaning, power tool cleaning, or sandblast cleaning; remove grease, oil, and other contaminants which could impair coating performance or appearance by solvent cleaning, with phosphoric-acid solution cleaning of welds, bolts and nuts; spot-prime repaired welds with specified primer.

I. Metals - Ferrous, Shop-Primed: Remove loose primer and rust, if present, by scraping and sanding, feathering edges of cleaned areas to produce uniform flat surface; solvent-clean surfaces and spot-prime bare metal with specified primer, feathering edges to produce uniform flat surface.

J. Metals - Galvanized Steel (not passivated): Clean with a water-based industrial strength cleaner, apply an adhesion promoter followed by a clean water rinse. Alternately, wipe down surfaces using clean, lint-free cloths saturated with xylene or lacquer thinner; followed by wiping the surface dry using clean, lint-free cloths.

K. Metals - Galvanized Steel, Passivated: Clean with water-based industrial strength cleaner. After the surface has been prepared, apply recommended primer to a small area. Allow primer to cure for 7 days, and test adhesion using the "cross-hatch adhesion tape test" method in accordance with ASTM D 3359. If the adhesion of the primer is positive, proceed with a recommended coating system for galvanized metal.

L. Metals - Stainless Steel: Clean surfaces with pressurized steam, pressurized water, or water-based industrial cleaner.

M. Plaster: Repair cracks, holes and other surface defects as required to maintain proper surface adhesion. Apply patching plaster or Joint compound and sand to produce surface flush with adjacent undamaged surface. Allow a full cure prior to coating application as recommended by the patching compound manufacturer's recommendations.

N. Polyvinyl Chloride (PVC) Pipe: remove contaminants and markings with denatured alcohol scuff sand and wipe with solvent for maximum adhesion. Test adhesion before starting the job.

O. Fiberglass Doors - remove contaminants with cleaning solvent (alcohol) scuff sand and wipe. Test adhesion of primer before starting job.

P. Textiles - Insulated Coverings, Canvas or Cotton: Clean using high-pressure air and solvent of type recommended for material.

Q. Wood:
1. Seal knots, pitch streaks, and sap areas with sealer recommended by coating manufacturer; fill nail recesses and cracks with filler recommended by coating manufacturer; sand surfaces smooth.
2. Remove mill marks and ink stamped grade marks.
3. Apply primer coat to back of wood trim and paneling.

R. Wood Doors: Seal door tops and bottoms prior to finishing.

S. Wood Doors - Field-Glazed Frames and Sash: Prime or seal glazing channels prior to glazing.

3.4 APPLICATION - GENERAL

A. Application of primers, paints, stains or coatings, by the Contractor, will serve as acceptance that surfaces were properly prepared in accordance with the manufacturer's recommendation.

B. Apply each coat to uniform coating thickness in accordance with manufacturer's instructions, not exceeding manufacturer's specified maximum spread rate for indicated surface; thins, brush marks, roller marks, orange-peel, or other application imperfections are not permitted.

C. Allow manufacturer's specified drying time, and ensure correct coating adhesion, for each coat before applying next coat.

D. Inspect each coat before applying next coat; touch-up surface imperfections with coating material, feathering, and sanding if required; touch-up areas to achieve flat, uniform surface without surface defects visible from 5 feet (1.5 m).

E. Remove dust and other foreign materials from substrate immediately prior to applying each coat.

F. Where paint application abuts other materials or other coating color, terminate coating with a clean sharp termination line without coating overlap.

G. Where color changes occur between adjoining spaces, through framed openings that are of same color as adjoining surfaces, change color at outside stop corner nearest to face of closed door.

H. Re-prepare and re-coat unsatisfactory finishes; refinish entire area to corners or other natural terminations.

3.5 CLEANING

A. Clean excess coating materials, and coating materials deposited on surfaces not indicated to receive coatings, as construction activities of this section progress; do not allow to dry.

B. Re-install hardware, electrical equipment plates, mechanical grilles and louvers, lighting fixture trim, and other items that have been removed to protect from contact with coatings.

C. Reconnect equipment adjacent to surfaces indicated to receive coatings.

D. Relocate to original position equipment and fixtures that have been moved to allow application of coatings.

E. Remove protective materials.

3.6 PROTECTION AND REPAIR

A. Protect completed coating applications from damage by subsequent construction activities until completion of painting project.

B. Touch-up coatings damaged by subsequent construction activities.

END OF SECTION