ANISHINABE DESIGN

PROJECT MANUAL

JOHN ROSS MUSEUM
22366 S. 530 RD.
PARK HILL, OKLAHOMA 74451

Job No.: C39622 AD

Date: 02 - 27 - 2023

Cherokee Nation Businesses
Department of Cultural Tourism

219 W. BOYD ST. SUITE 203 NORMAN, OK 73069 405.360.5818 ANISHINABEDESIGN.COM

PROJECT DIRECTORY

OWNER:	ARCHITECT OF RECORD:
Cherokee Nation Businesses, LLC Department of Cultural Tourism Marshall Building (Interchange Suites) 10838 E. Marshall St. Suite 250 Tulsa, OK 74116 Office: (918) 384-5929 Primary Contact: Jesse Gates Email: Jesse.gates@cm-bus.com	Anishinabe Design, Inc. 219 Boyd Street, Suite 203 Norman, OK 73069 Office: (405) 360-5818 Primary Contact: Barrett Williamson Email: blw@anishinabedesign.com Secondary Contact: Josh Linhardt Email: jl@blwarchitects.com
	STRUCTURAL:
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(ADI) PREPARED BY ANISHINABE DESIGN, INC. - ARCHITECT OF RECORD
(WDC) PREPARED BY WALLACE DESIGN COLLECTIVE, P.C. - STRUCTURAL ENGINEER

END OF SECTION

SEAL / SIGNATURE SHEET

John Ross Museum
22366 S. 530 RD.
Park Hill, Oklahoma 74451

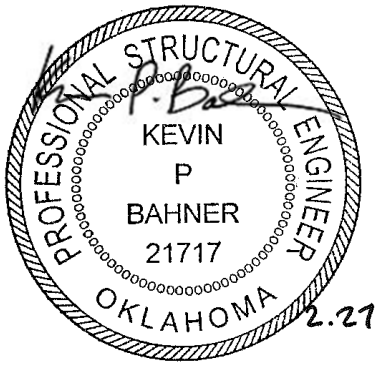
Barrett L. Williamson Architects

ARCHITECT OF RECORD SEAL

02 - 27 - 2023

Wallace Design Collective, PC

STRUCTURAL ENGINEER SEAL



2.27.23

SECTION 01 1000
SUMMARY

PART 1 GENERAL

1.01 PROJECT

A. Project Name: John Ross Museum.

B. Owner's Name: Cherokee Nation Businesses Department of Cultural Tourism.

C. Architect's Name: Anishinabe Design.

D. Additional Project contact information is specified in Section 00 0103 - Project Directory.

E. The Project consists of basement foundation repairs and associated stabilization. Provide below and above grade protection and waterproofing systems, masonry repair and preparation for repainting of exterior masonry. Replacement of exterior doors and windows and associated opening repairs. Interior work primarily involves but not limited to lighting upgrades to LED lighting.

1.02 CONTRACT DESCRIPTION

A. Contract Type: Multiple prime contracts, each based on a Stipulated Price as described in Document 00 5000 - Contracting Forms and Supplements.

1.03 OWNER OCCUPANCY

A. Owner intends to occupy the Project upon Substantial Completion.

B. Cooperate with Owner to minimize conflict and to facilitate Owner's operations.

C. Schedule the Work to accommodate Owner occupancy.

1.04 CONTRACTOR USE OF SITE AND PREMISES

A. Construction Operations: Limited to areas noted on Drawings.
   1. Locate and conduct construction activities in ways that will limit disturbance to site.

B. Arrange use of site and premises to allow:
   1. Owner occupancy.
   2. Use of site and premises by the public.

C. Provide access to and from site as required by law and by Owner:
   1. Emergency Building Exits During Construction: Keep all exits required by code open and free of debris during construction period; provide temporary exit signs if exit routes are temporarily altered.
   2. Do not obstruct roadways, sidewalks, or other public ways without permit.

D. Existing building spaces may not be used for storage.

E. Utility Outages and Shutdown:
   1. To the greatest extent limit disruption of utility services to hours the building is unoccupied.
   2. Do not disrupt or shut down life safety systems, including but not limited to fire sprinklers and fire alarm system, without 7 days notice to Owner and authorities having jurisdiction.
   3. Prevent accidental disruption of utility services to other facilities.

PART 2 PRODUCTS - NOT USED

PART 3 EXECUTION - NOT USED

END OF SECTION

SECTION 01 2500
SUBSTITUTION PROCEDURES

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Procedural requirements for proposed substitutions.

1.02 RELATED REQUIREMENTS

A. Section 01 3000 - Administrative Requirements: Submittal procedures, coordination.

1.03 DEFINITIONS

A. Substitutions: Changes from Contract Documents requirements proposed by Contractor to materials, products, assemblies, and equipment.
   1. Substitutions for Cause: Proposed due to changed Project circumstances beyond Contractor's control.
      a. Unavailability.
      b. Regulatory changes.
   2. Substitutions for Convenience: Proposed due to possibility of offering substantial advantage to the Project.
      a. Substitution requests offering advantages solely to the Contractor will not be considered.

1.04 REFERENCE STANDARDS

A. CSI/CSC Form 1.5C - Substitution Request (During the Bidding/Negotiating Stage) Current Edition.

B. CSI/CSC Form 13.1A - Substitution Request (After the Bidding/Negotiating Phase) Current Edition.

PART 2 PRODUCTS - NOT USED

PART 3 EXECUTION

3.01 GENERAL REQUIREMENTS

A. A Substitution Request for products, assemblies, materials, and equipment constitutes a representation that the submitter:
   1. Has investigated proposed product and determined that it meets or exceeds the quality level of the specified product, equipment, assembly, or system.
   2. Agrees to provide the same warranty for the substitution as for the specified product.
   3. Agrees to coordinate installation and make changes to other work that may be required for the work to be complete, with no additional cost to Owner.
   4. Waives claims for additional costs or time extension that may subsequently become apparent.

B. Document each request with complete data substantiating compliance of proposed substitution with Contract Documents. Burden of proof is on proposer.

C. Content: Include information necessary for tracking the status of each Substitution Request, and information necessary to provide an actionable response.
   1. The submission of forms other than what is indicated may be rejected due to inadequate information. Contractor's Substitution Request documentation must include the following:
      a. Project Information:
         1) Official project name and number, and any additional required identifiers established in Contract Documents.
         2) Owner's, Architect's, and Contractor's names.
      b. Substitution Request Information:
         1) Indication of whether the substitution is for cause or convenience.
         2) Issue date.
         3) Reference to particular Contract Document(s) specification section number, title, and article/paragraph(s).
         4) Description of Substitution.
         5) Reason why the specified item cannot be provided.
         6) Differences between proposed substitution and specified item.
         7) Description of how proposed substitution affects other parts of work.

c. Attached Comparative Data: Provide point-by-point, side-by-side comparison addressing essential attributes specified, as appropriate and relevant for the item:
   1) Physical characteristics.
   2) In-service performance.
   3) Visual effect.
   4) Warranties.
   5) Include, as appropriate or requested, the following types of documentation:
      (a) Product Data:
      (b) Samples.
      (c) Certificates, test, reports or similar qualification data.
      (d) Drawings, when required to show impact on adjacent construction elements.

d. Impact of Substitution:
   1) Savings to Owner for accepting substitution.
   2) Change to Contract Time due to accepting substitution.

D. Limit each request to a single proposed substitution item.
   1. Submit an electronic document, combining the request form with supporting data into single document.

3.02 SUBSTITUTION PROCEDURES DURING PROCUREMENT

A. Submittal Time Restrictions:
   1. Owner will consider requests for substitutions only if submitted at least 7 days prior to the date for receipt of bids.

3.03 SUBSTITUTION PROCEDURES DURING CONSTRUCTION

A. Submit request for Substitution for Cause within 14 days of discovery of need for substitution, but not later than 14 days prior to time required for review and approval by Architect, in order to stay on approved project schedule.

B. Submit request for Substitution for Convenience immediately upon discovery of its potential advantage to the project, but not later than 14 days prior to time required for review and approval by Architect, in order to stay on approved project schedule.
   1. In addition to meeting general documentation requirements, document how the requested substitution benefits the Owner through cost savings, time savings, greater energy conservation, or in other specific ways.
   2. Document means of coordinating of substitution item with other portions of the work, including work by affected subcontractors.
   3. Bear the costs engendered by proposed substitution of:
      a. Owner's compensation to the Architect for any required redesign, time spent processing and evaluating the request.

C. Substitutions will not be considered under one or more of the following circumstances:
   1. When they are indicated or implied on shop drawing or product data submittals, without having received prior approval.

3.04 RESOLUTION

A. Architect may request additional information and documentation prior to rendering a decision. Provide this data in an expeditious manner.

B. Architect will notify Contractor in writing of decision to accept or reject request.
   1. Architect's decision following review of proposed substitution will be noted on the submitted form.

3.05 ACCEPTANCE

A. Accepted substitutions change the work of the Project. They will be documented and incorporated into work of the project by Change Order, Construction Change Directive, Architectural Supplementary Instructions, or similar instruments provided for in the Conditions of the Contract.

3.06 CLOSEOUT ACTIVITIES

A. See Section 01 7800 - Closeout Submittals, for closeout submittals.

B. Include completed Substitution Request Forms as part of the Project record. Include both approved and rejected Requests.

END OF SECTION

SECTION 01 3000
ADMINISTRATIVE REQUIREMENTS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. General administrative requirements.

B. Preconstruction meeting.

C. Progress meetings.

D. Construction progress schedule.

E. Submittals for review, information, and project closeout.

F. Number of copies of submittals.

G. Requests for Information (RFI) procedures.

H. Submittal procedures.

1.02 RELATED REQUIREMENTS

A. Section 01 6000 - Product Requirements: General product requirements.

B. Section 01 7800 - Closeout Submittals: Project record documents; operation and maintenance data; warranties and bonds.

1.03 REFERENCE STANDARDS

A. CSI/CSC Form 12.1A - Submittal Transmittal Current Edition.

B. CSI/CSC Form 13.2A - Request for Information Current Edition.

1.04 GENERAL ADMINISTRATIVE REQUIREMENTS

A. Comply with requirements of Section 01 7000 - Execution and Closeout Requirements for coordination of execution of administrative tasks with timing of construction activities.

B. Make the following types of submittals to Architect:
   1. Requests for Information (RFI).
   2. Requests for substitution.
   3. Shop drawings, product data, and samples.
   4. Test and inspection reports.
   5. Design data.
   6. Manufacturer's instructions and field reports.
   7. Applications for payment and change order requests.
   8. Progress schedules.
   9. Coordination drawings.
   10. Correction Punch List and Final Correction Punch List for Substantial Completion.
   11. Closeout submittals.

1.05 PROJECT COORDINATOR

A. Project Coordinator: Construction Manager.

B. Cooperate with the Project Coordinator in allocation of mobilization areas of site; for field offices and sheds, for [_____] access, traffic, and parking facilities.

C. During construction, coordinate use of site and facilities through the Project Coordinator.

D. Comply with Project Coordinator's procedures for intra-project communications; submittals, reports and records, schedules, coordination drawings, and recommendations; and resolution of ambiguities and conflicts.

E. Comply with instructions of the Project Coordinator for use of temporary utilities and construction facilities. Responsibility for providing temporary utilities and construction facilities is identified in Section 01 1000 - Summary.

F. Coordinate field engineering and layout work under instructions of the Project Coordinator.

G. Make the following types of submittals to Architect through the Project Coordinator:
   1. Requests for Information.
   2. Requests for substitution.
   3. Shop drawings, product data, and samples.
   4. Test and inspection reports.
   5. Design data.
   6. Manufacturer's instructions and field reports.
   7. Applications for payment and change order requests.
   8. Progress schedules.
   9. Correction Punch List and Final Correction Punch List for Substantial Completion.

PART 2 PRODUCTS - NOT USED

PART 3 EXECUTION

3.01 PRECONSTRUCTION MEETING

A. Project Coordinator will schedule a meeting after Notice of Award.

B. Attendance Required:
   1. Owner.
   2. Architect.
   3. Contractor.

C. Agenda:
   1. Execution of Owner-Contractor Agreement.
   2. Submission of executed bonds and insurance certificates.
   3. Distribution of Contract Documents.
   4. Submission of list of subcontractors, list of products, schedule of values, and progress schedule.
   5. Designation of personnel representing the parties to Contract and Architect.
   6. Procedures and processing of field decisions, submittals, substitutions, applications for payments, proposal request, Change Orders, and Contract closeout procedures.
   7. Scheduling.

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

3.02 PROGRESS MEETINGS

A. Project Coordinator will make arrangements for meetings, prepare agenda with copies for participants, preside at meetings.

B. Attendance Required:
   1. Contractor.
   2. Owner.
   3. Architect.
   4. Contractor's superintendent.
   5. Major subcontractors.

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. Maintenance of progress schedule.
   7. Corrective measures to regain projected schedules.
   8. Planned progress during succeeding work period.
   9. Maintenance of quality and work standards.
   10. Effect of proposed changes on progress schedule and coordination.
   11. Other business relating to work.

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

3.03 CONSTRUCTION PROGRESS SCHEDULE

A. If preliminary schedule requires revision after review, submit revised schedule within 10 days.

B. Within 20 days after review of preliminary schedule, submit draft of proposed complete schedule for review.
   1. Include written certification that major contractors have reviewed and accepted proposed schedule.

C. Within 10 days after joint review, submit complete schedule.

D. Submit updated schedule with each Application for Payment.

3.04 REQUESTS FOR INFORMATION (RFI)

A. Definition: A request seeking one of the following:
   1. An interpretation, amplification, or clarification of some requirement of Contract Documents arising from inability to determine from them the exact material, process, or system to be installed; or when the elements of construction are required to occupy the same space (interference); or when an item of work is described differently at more than one place in Contract Documents.
   2. A resolution to an issue which has arisen due to field conditions and affects design intent.

B. Preparation: Prepare an RFI immediately upon discovery of a need for interpretation of Contract Documents. Failure to submit a RFI in a timely manner is not a legitimate cause for claiming additional costs or delays in execution of the work.
   1. Prepare a separate RFI for each specific item.
      a. Review, coordinate, and comment on requests originating with subcontractors and/or materials suppliers.
      b. Do not forward requests which solely require internal coordination between subcontractors.
   2. Prepare in a format and with content acceptable to Owner.
      a. Use CSI/CSC Form 13.2A - Request for Interpretation.
   3. Prepare using an electronic version of the form appended to this section.
   4. Combine RFI and its attachments into a single electronic file. PDF format is preferred.

C. Reason for the RFI: Prior to initiation of an RFI, carefully study all Contract Documents to confirm that information sufficient for their interpretation is definitely not included.
   1. Unacceptable Uses for RFIs: Do not use RFIs to request the following::
      a. Approval of submittals (use procedures specified elsewhere in this section).
      b. Approval of substitutions (see Section - 01 6000 - Product Requirements)
      c. Changes that entail change in Contract Time and Contract Sum (comply with provisions of the Conditions of the Contract).
   2. Improper RFIs: Requests not prepared in compliance with requirements of this section, and/or missing key information required to render an actionable response. They will be returned without a response, with an explanatory notation.
   3. Frivolous RFIs: Requests regarding information that is clearly indicated on, or reasonably inferable from, Contract Documents, with no additional input required to clarify the question. They will be returned without a response, with an explanatory notation.

D. Content: Include identifiers necessary for tracking the status of each RFI, and information necessary to provide an actionable response.
   1. Official Project name and number, and any additional required identifiers established in Contract Documents.
   2. Owner's, Architect's, and Contractor's names.
   3. Discrete and consecutive RFI number, and descriptive subject/title.
   4. Issue date, and requested reply date.
   5. Reference to particular Contract Document(s) requiring additional information/interpretation. Identify pertinent drawing and detail number and/or specification section number, title, and

paragraph(s).

6. Annotations: Field dimensions and/or description of conditions which have engendered the request.
7. Contractor's suggested resolution: A written and/or a graphic solution, to scale, is required in cases where clarification of coordination issues is involved, for example; routing, clearances, and/or specific locations of work shown diagrammatically in Contract Documents. If applicable, state the likely impact of the suggested resolution on Contract Time or the Contract Sum.

E. Attachments: Include sketches, coordination drawings, descriptions, photos, submittals, and other information necessary to substantiate the reason for the request.

F. RFI Log: Prepare and maintain a tabular log of RFIs for the duration of the project.
1. Indicate current status of every RFI. Update log promptly and on a regular basis.
2. Note dates of when each request is made, and when a response is received.
3. Highlight items requiring priority or expedited response.
4. Highlight items for which a timely response has not been received to date.

G. Review Time: Architect will respond and return RFIs to Contractor within seven calendar days of receipt. For the purpose of establishing the start of the mandated response period, RFIs received after 12:00 noon will be considered as having been received on the following regular working day.
1. Response period may be shortened or lengthened for specific items, subject to mutual agreement, and recorded in a timely manner in progress meeting minutes.

H. Responses: Content of answered RFIs will not constitute in any manner a directive or authorization to perform extra work or delay the project. If in Contractor's belief it is likely to lead to a change to Contract Sum or Contract Time, promptly issue a notice to this effect, and follow up with an appropriate Change Order request to Owner.
1. Response may include a request for additional information, in which case the original RFI will be deemed as having been answered, and an amended one is to be issued forthwith. Identify the amended RFI with an R suffix to the original number.
2. Do not extend applicability of a response to specific item to encompass other similar conditions, unless specifically so noted in the response.
3. Upon receipt of a response, promptly review and distribute it to all affected parties, and update the RFI Log.
4. Notify Architect within seven calendar days if an additional or corrected response is required by submitting an amended version of the original RFI, identified as specified above.

3.05 SUBMITTAL SCHEDULE

A. Submit to Architect for review a schedule for submittals in tabular format.
1. Coordinate with Contractor's construction schedule and schedule of values.
2. Format schedule to allow tracking of status of submittals throughout duration of construction.
3. Arrange information to include scheduled date for initial submittal, specification number and title, submittal category (for review or for information), description of item of work covered, and role and name of subcontractor.
4. Account for time required for preparation, review, manufacturing, fabrication and delivery when establishing submittal delivery and review deadline dates.
    a. For assemblies, equipment, systems comprised of multiple components and/or requiring detailed coordination with other work, allow for additional time to make corrections or revisions to initial submittals, and time for their review.

3.06 SUBMITTALS FOR REVIEW

A. When the following are specified in individual sections, submit them for review:
1. Product data.
2. Shop drawings.
3. Samples for selection.
4. Samples for verification.

B. Submit to Architect for review for the limited purpose of checking for compliance with information given and the design concept expressed in Contract Documents.

C. Samples will be reviewed for aesthetic, color, or finish selection.

D. After review, provide copies and distribute in accordance with SUBMITTAL PROCEDURES article below and for record documents purposes described in Section 01 7800 - Closeout Submittals.

3.07 SUBMITTALS FOR INFORMATION

A. When the following are specified in individual sections, submit them for information:
   1. Design data.
   2. Certificates.
   3. Test reports.
   4. Inspection reports.
   5. Manufacturer's instructions.
   6. Manufacturer's field reports.
   7. Other types indicated.

B. Submit for Architect's knowledge as contract administrator or for Owner.

3.08 SUBMITTALS FOR PROJECT CLOSEOUT

A. Submit Correction Punch List for Substantial Completion.

B. Submit Final Correction Punch List for Substantial Completion.

C. When the following are specified in individual sections, submit them at project closeout in compliance with requirements of Section 01 7800 - Closeout Submittals:
   1. Project record documents.
   2. Operation and maintenance data.
   3. Warranties.
   4. Bonds.
   5. Other types as indicated.

D. Submit for Owner's benefit during and after project completion.

3.09 NUMBER OF COPIES OF SUBMITTALS

A. Electronic Documents: Submit one electronic copy in PDF format; an electronically-marked up file will be returned. Create PDFs at native size and right-side up; illegible files will be rejected.

B. Samples: Submit the number specified in individual specification sections; one of which will be retained by Architect.
   1. After review, produce duplicates.
   2. Retained samples will not be returned to Contractor unless specifically so stated.

3.10 SUBMITTAL PROCEDURES

A. General Requirements:
   1. Use a separate transmittal for each item.
   2. Transmit using approved form.
      a. Use Form CSI/CSC Form 12.1A.
   3. Identify: Project; Contractor; subcontractor or supplier; pertinent drawing and detail number; and specification section number and article/paragraph, as appropriate on each copy.
   4. Apply Contractor's stamp, signed or initialed certifying that review, approval, verification of products required, field dimensions, adjacent construction work, and coordination of information is in accordance with the requirements of the work and Contract Documents.
      a. Submittals from sources other than the Contractor, or without Contractor's stamp will not be acknowledged, reviewed, or returned.
   5. Deliver each submittal on date noted in submittal schedule, unless an earlier date has been agreed to by all affected parties, and is of the benefit to the project.
      a. Deliver submittals to Construction Manager at business address.
   6. Schedule submittals to expedite the Project, and coordinate submission of related items.
      a. For each submittal for review, allow 15 days excluding delivery time to and from the Contractor.

b. For sequential reviews involving Architect's consultants, Owner, or another affected party, allow an additional 7 days.

7. Provide space for Contractor and Architect review stamps.
8. When revised for resubmission, identify all changes made since previous submission.
9. Distribute reviewed submittals. Instruct parties to promptly report inability to comply with requirements.
10. Incomplete submittals will not be reviewed, unless they are partial submittals for distinct portion(s) of the work, and have received prior approval for their use.

B. Product Data Procedures:
1. Submit only information required by individual specification sections.
2. Collect required information into a single submittal.
3. Do not submit (Material) Safety Data Sheets for materials or products.

C. Shop Drawing Procedures:
1. Prepare accurate, drawn-to-scale, original shop drawing documentation by interpreting Contract Documents and coordinating related work.
2. Do not reproduce Contract Documents to create shop drawings.
3. Generic, non-project-specific information submitted as shop drawings do not meet the requirements for shop drawings.

D. Samples Procedures:
1. Transmit related items together as single package.
2. Identify each item to allow review for applicability in relation to shop drawings showing installation locations.

3.11 SUBMITTAL REVIEW

A. Submittals for Review: Architect will review each submittal, and approve, or take other appropriate action.

B. Submittals for Information: Architect will acknowledge receipt and review. See below for actions to be taken.

C. Architect's actions will be reflected by marking each returned submittal using virtual stamp on electronic submittals.

D. Architect's and consultants' actions on items submitted for review:
1. Authorizing purchasing, fabrication, delivery, and installation:
a. "Approved", or language with same legal meaning.
b. "Approved as Noted, Resubmission not required", or language with same legal meaning.
1) At Contractor's option, submit corrected item, with review notations acknowledged and incorporated.
c. "Approved as Noted, Resubmit for Record", or language with same legal meaning.
2. Not Authorizing fabrication, delivery, and installation:

E. Architect's and consultants' actions on items submitted for information:
1. Items for which no action was taken:
a. "Received" - to notify the Contractor that the submittal has been received for record only.
2. Items for which action was taken:
a. "Reviewed" - no further action is required from Contractor.

END OF SECTION

SECTION 01 4000
QUALITY REQUIREMENTS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Submittals.

B. Quality assurance.

C. References and standards.

D. Testing and inspection agencies and services.

E. Control of installation.

F. Mock-ups.

G. Defect Assessment.

1.02 SUBMITTALS

A. See Section 01 3000 - Administrative Requirements, for submittal procedures.

B. Design Data: Submit for Architect's knowledge as contract administrator for the limited purpose of assessing compliance with information given and the design concept expressed in the Contract Documents, or for Owner's information.

C. Test Reports: After each test/inspection, promptly submit two copies of report to Architect and to Contractor.
   1. Include:
      a. Date issued.
      b. Project title and number.
      c. Name of inspector.
      d. Date and time of sampling or inspection.
      e. Identification of product and specifications section.
      f. Location in the Project.
      g. Type of test/inspection.
      h. Date of test/inspection.
      i. Results of test/inspection.
      j. Compliance with Contract Documents.
      k. When requested by Architect, provide interpretation of results.
   2. Test report submittals are for Architect's knowledge as contract administrator for the limited purpose of assessing compliance with information given and the design concept expressed in the Contract Documents, or for Owner's information.

D. Manufacturer's Instructions: When specified in individual specification sections, submit printed instructions for delivery, storage, assembly, installation, start-up, adjusting, and finishing, for the Owner's information. Indicate special procedures, perimeter conditions requiring special attention, and special environmental criteria required for application or installation.

1.03 QUALITY ASSURANCE

A. Testing Agency Qualifications:
   1. Prior to start of work, submit agency name, address, and telephone number, and names of full time registered Engineer and responsible officer.

1.04 REFERENCES AND STANDARDS

A. For products and workmanship specified by reference to a document or documents not included in the Project Manual, also referred to as reference standards, comply with requirements of the standard, except when more rigid requirements are specified or are required by applicable codes.

B. Comply with reference standard of date of issue current on date of Contract Documents, except where a specific date is established by applicable code.

C. Obtain copies of standards where required by product specification sections.

D. Maintain copy at project site during submittals, planning, and progress of the specific work, until Substantial Completion.

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

F. Neither the contractual relationships, duties, or responsibilities of the parties in Contract nor those of Architect shall be altered from Contract Documents by mention or inference otherwise in any reference document.

1.05 TESTING AND INSPECTION AGENCIES AND SERVICES

A. Owner will employ and pay for services of an independent testing agency to perform other specified testing.

B. Employment of agency in no way relieves Contractor of obligation to perform Work in accordance with requirements of Contract Documents.

PART 2 PRODUCTS - NOT USED

PART 3 EXECUTION

3.01 CONTROL OF INSTALLATION

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

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

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

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

E. Have work performed by persons qualified to produce required and specified quality.

F. Verify that field measurements are as indicated on shop drawings or as instructed by the manufacturer.

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

3.02 MOCK-UPS

A. Tests shall be performed under provisions identified in this section and identified in the respective product specification sections.

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

C. Architect will use accepted mock-ups as a comparison standard for the remaining Work.

D. Where mock-up has been accepted by Architect and is specified in product specification sections to be removed, protect mock-up throughout construction, remove mock-up and clear area when directed to do so by Architect.

3.03 TESTING AND INSPECTION

A. Testing Agency Duties:
   1. Provide qualified personnel at site. Cooperate with Architect and Contractor in performance of services.
   2. Perform specified sampling and testing of products in accordance with specified standards.
   3. Ascertain compliance of materials and mixes with requirements of Contract Documents.
   4. Promptly notify Architect and Contractor of observed irregularities or non-compliance of Work or products.
   5. Perform additional tests and inspections required by Architect.
   6. Submit reports of all tests/inspections specified.

B. Limits on Testing/Inspection Agency Authority:

1. Agency may not release, revoke, alter, or enlarge on requirements of Contract Documents.
2. Agency may not approve or accept any portion of the Work.
3. Agency may not assume any duties of Contractor.
4. Agency has no authority to stop the Work.

C. Contractor Responsibilities:
1. Deliver to agency at designated location, adequate samples of materials proposed to be used that require testing, along with proposed mix designs.
2. Cooperate with laboratory personnel, and provide access to the Work and to manufacturers' facilities.
3. Provide incidental labor and facilities:
a. To provide access to Work to be tested/inspected.
b. To obtain and handle samples at the site or at source of Products to be tested/inspected.
c. To facilitate tests/inspections.
d. To provide storage and curing of test samples.
4. Notify Architect and laboratory 24 hours prior to expected time for operations requiring testing/inspection services.
5. Employ services of an independent qualified testing laboratory and pay for additional samples, tests, and inspections required by Contractor beyond specified requirements.
6. Arrange with Owner's agency and pay for additional samples, tests, and inspections required by Contractor beyond specified requirements.

D. Re-testing required because of non-compliance with specified requirements shall be performed by the same agency on instructions by Architect.

E. Re-testing required because of non-compliance with specified requirements shall be paid for by Contractor.

3.04 DEFECT ASSESSMENT

A. Replace Work or portions of the Work not complying with specified requirements.

END OF SECTION

SECTION 01 5000
TEMPORARY FACILITIES AND CONTROLS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Temporary utilities.

B. Temporary sanitary facilities.

C. Temporary Controls: Barriers, enclosures, and fencing.

D. Security requirements.

E. Waste removal facilities and services.

1.02 RELATED REQUIREMENTS

A. Section 01 5100 - Temporary Utilities.

1.03 TEMPORARY UTILITIES - SEE SECTION 01 5100

1.04 TEMPORARY SANITARY FACILITIES

A. Provide and maintain required facilities and enclosures. Provide at time of project mobilization.

B. Maintain daily in clean and sanitary condition.

1.05 BARRIERS

A. Provide barriers to prevent unauthorized entry to construction areas, to prevent access to areas that could be hazardous to workers or the public, to allow for owner's use of site and to protect existing facilities and adjacent properties from damage from construction operations and demolition.

B. Provide barricades and covered walkways required by governing authorities for public rights-of-way and for public access to existing building.

C. Protect non-owned vehicular traffic, stored materials, site, and structures from damage.

1.06 FENCING

A. Provide 6 foot high fence around construction site; equip with vehicular and pedestrian gates with locks.

1.07 SECURITY - SEE SECTION 01 3553

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

1.08 WASTE REMOVAL

A. Provide waste removal facilities and services as required to maintain the site in clean and orderly condition.

B. Provide containers with lids. Remove trash from site periodically.

C. If materials to be recycled or re-used on the project must be stored on-site, provide suitable non-combustible containers; locate containers holding flammable material outside the structure unless otherwise approved by the authorities having jurisdiction.

D. Open free-fall chutes are not permitted. Terminate closed chutes into appropriate containers with lids.

PART 2 PRODUCTS - NOT USED

PART 3 EXECUTION - NOT USED

END OF SECTION

SECTION 01 5100
TEMPORARY UTILITIES

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Temporary Utilities: Provision of electricity, lighting, heat, and ventilation.

1.02 REFERENCE STANDARDS

A. 29 CFR 1926 - Safety and Health Regulations for Construction Current Edition.

1.03 TEMPORARY ELECTRICITY

A. Cost: By Contractor.

B. Connect to Owner's existing power service.

C. Provide temporary electric feeder from existing building electrical service at .

D. Provide power outlets for construction operations, with branch wiring and distribution boxes located as required. Provide flexible power cords as required.

E. Provide adequate distribution equipment, wiring, and outlets to provide single phase branch circuits for temporary power and lighting.

1.04 TEMPORARY LIGHTING FOR CONSTRUCTION PURPOSES

A. Provide and maintain LED, compact fluorescent, or high-intensity discharge lighting as suitable for the application for construction operations in accordance with requirements of 29 CFR 1926 and authorities having jurisdiction.

B. Provide branch wiring from power source to distribution boxes with lighting conductors, pigtails, and lamps as required.

C. Maintain lighting and provide routine repairs.

1.05 TEMPORARY HEATING

A. Provide heating devices and heat as needed to maintain specified conditions for construction operations.

B. Maintain minimum ambient temperature of 50 degrees F in the entire building and areas where construction is in progress, unless indicated otherwise in specifications.

C. Provide temporary electrical service to existing HVAC units as required to meet specified temperatures.

1.06 TEMPORARY COOLING

A. Provide cooling devices or temporary electrical service to existing HVAC units and maintain cooling as needed to maintain specified conditions for construction operations.

B. Maintain maximum ambient temperature of 80 degrees F in areas where construction is in progress, unless indicated otherwise in specifications.

1.07 TEMPORARY VENTILATION

A. Utilize existing ventilation equipment. Provide temporary electrical sevice to existing HVAC units and supplement equipment with temporary fan units as required to maintain clean air for construction operations.

PART 2 PRODUCTS - NOT USED

PART 3 EXECUTION - NOT USED

END OF SECTION

SECTION 01 5713
TEMPORARY EROSION AND SEDIMENT CONTROL

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Prevention of erosion due to construction activities.

B. Prevention of sedimentation of waterways, open drainage ways, and storm and sanitary sewers due to construction activities.

C. Restoration of areas eroded due to insufficient preventive measures.

D. Performance bond.

E. Compensation of Owner for fines levied by authorities having jurisdiction due to non-compliance by Contractor.

1.02 RELATED REQUIREMENTS

A. Section 03 3000 - Cast-in-Place Concrete: Concrete for temporary and permanent erosion control structures indicated on drawings.

B. Section 31 2200 - Grading: Temporary and permanent grade changes for erosion control.

C. Section 32 1123 - Aggregate Base Courses: Temporary and permanent roadways.

D. Section 32 9223 - Sodding: Permanent turf for erosion control.

1.03 REFERENCE STANDARDS

A. ASTM D4355/D4355M - Standard Test Method for Deterioration of Geotextiles by Exposure to Light, Moisture, and Heat in a Xenon Arc-Type Apparatus 2021.

B. ASTM D4491/D4491M - Standard Test Methods for Water Permeability of Geotextiles by Permittivity 2022.

C. ASTM D4533/D4533M - Standard Test Method for Trapezoid Tearing Strength of Geotextiles 2015.

D. ASTM D4632/D4632M - Standard Test Method for Grab Breaking Load and Elongation of Geotextiles 2015a.

E. ASTM D4751 - Standard Test Methods for Determining Apparent Opening Size of a Geotextile 2021a.

F. ASTM D4873/D4873M - Standard Guide for Identification, Storage, and Handling of Geosynthetic Rolls and Samples 2017 (Reapproved 2021).

1.04 PERFORMANCE REQUIREMENTS

A. Develop and follow an Erosion and Sedimentation Prevention Plan and submit periodic inspection reports.

B. Do not begin clearing, grading, or other work involving disturbance of ground surface cover until applicable permits have been obtained; furnish all documentation required to obtain applicable permits.

C. Provide to Owner a Performance Bond covering erosion and sedimentation preventive measures only, in an amount equal to 100 percent of the cost of erosion and sedimentation control work.

D. Timing: Put preventive measures in place as soon as possible after disturbance of surface cover and before precipitation occurs.

E. Storm Water Runoff: Control increased storm water runoff due to disturbance of surface cover due to construction activities for this project.
   1. Prevent runoff into storm and sanitary sewer systems, including open drainage channels, in excess of actual capacity or amount allowed by authorities having jurisdiction, whichever is less.
   2. Anticipate runoff volume due to the most extreme short term and 24-hour rainfall events that might occur in 25 years.

F. Erosion On Site: Minimize wind, water, and vehicular erosion of soil on project site due to construction activities for this project.
   1. Control movement of sediment and soil from temporary stockpiles of soil.
   2. Prevent development of ruts due to equipment and vehicular traffic.
   3. If erosion occurs due to non-compliance with these requirements, restore eroded areas at no cost to Owner.

G. Erosion Off Site: Prevent erosion of soil and deposition of sediment on other properties caused by water leaving the project site due to construction activities for this project.
   1. Prevent windblown soil from leaving the project site.
   2. Prevent tracking of mud onto public roads outside site.
   3. Prevent mud and sediment from flowing onto sidewalks and pavements.
   4. If erosion occurs due to non-compliance with these requirements, restore eroded areas at no cost to Owner.

H. Sedimentation of Waterways On Site: Prevent sedimentation of waterways on the project site, including rivers, streams, lakes, ponds, open drainage ways, storm sewers, and sanitary sewers.
   1. If sedimentation occurs, install or correct preventive measures immediately at no cost to Owner; remove deposited sediments; comply with requirements of authorities having jurisdiction.
   2. If sediment basins are used as temporary preventive measures, pump dry and remove deposited sediment after each storm.

I. Sedimentation of Waterways Off Site: Prevent sedimentation of waterways off the project site, including rivers, streams, lakes, ponds, open drainage ways, storm sewers, and sanitary sewers.
   1. If sedimentation occurs, install or correct preventive measures immediately at no cost to Owner; remove deposited sediments; comply with requirements of authorities having jurisdiction.

J. Open Water: Prevent standing water that could become stagnant.

K. Maintenance: Maintain temporary preventive measures until permanent measures have been established.

1.05 SUBMITTALS

A. See Section 01 3000 - Administrative Requirements, for submittal procedures.

B. Erosion and Sedimentation Control Plan:
   1. Submit not less than 30 days prior to anticipated start of clearing, grading, or other work involving disturbance of ground surface cover.
   2. Include:
      a. Site plan identifying soils and vegetation, existing erosion problems, and areas vulnerable to erosion due to topography, soils, vegetation, or drainage.
      b. Site plan showing grading; new improvements; temporary roads, traffic accesses, and other temporary construction; and proposed preventive measures.
      c. Where extensive areas of soil will be disturbed, include storm water flow and volume calculations, soil loss predictions, and proposed preventive measures.
      d. Schedule of temporary preventive measures, in relation to ground disturbing activities.
      e. Other information required by law.
      f. Format required by law is acceptable, provided any additional information specified is also included.
   3. Obtain the approval of the Plan by authorities having jurisdiction.
   4. Obtain the approval of the Plan by Owner.

C. Certificate: Mill certificate for silt fence fabric attesting that fabric and factory seams comply with specified requirements, signed by legally authorized official of manufacturer; indicate actual minimum average roll values; identify fabric by roll identification numbers.

D. Inspection Reports: Submit report of each inspection; identify each preventive measure, indicate condition, and specify maintenance or repair required and accomplished.

PART 2 PRODUCTS

2.01 MATERIALS

A. Mulch: Use one of the following:
   1. Straw or hay.
   2. Erosion control matting or netting.

B. Grass Seed For Temporary Cover: Select a species appropriate to climate, planting season, and intended purpose. If same area will later be planted with permanent vegetation, do not use species known to be excessively competitive or prone to volunteer in subsequent seasons.

C. Bales: Air dry, rectangular straw bales.
   1. Cross Section: 14 by 18 inches, minimum.
   2. Bindings: Wire or string, around long dimension.

D. Bale Stakes: One of the following, minimum 3 feet long:
   1. Steel U- or T-section, with minimum mass of 1.33 pound per linear foot.
   2. Wood, 2 by 2 inches in cross section.

E. Silt Fence Fabric: Polypropylene geotextile resistant to common soil chemicals, mildew, and insects; non-biodegradable; in longest lengths possible; fabric including seams with the following minimum average roll lengths:
   1. Average Opening Size: 30 U.S. Std. Sieve, maximum, when tested in accordance with ASTM D4751.
   2. Permittivity: 0.05 sec^-1, minimum, when tested in accordance with ASTM D4491/D4491M.
   3. Ultraviolet Resistance: Retaining at least 70 percent of tensile strength, when tested in accordance with ASTM D4355/D4355M after 500 hours exposure.
   4. Tensile Strength: 100 pounds-force, minimum, in cross-machine direction; 124 pounds-force, minimum, in machine direction; when tested in accordance with ASTM D4632/D4632M.
   5. Elongation: 15 to 30 percent, when tested in accordance with ASTM D4632/D4632M.
   6. Tear Strength: 55 pounds-force, minimum, when tested in accordance with ASTM D4533/D4533M.
   7. Color: Manufacturer's standard, with embedment and fastener lines preprinted.

F. Silt Fence Posts: One of the following, minimum 5 feet long:
   1. Softwood, 4 by 4 inches in cross section.

G. Gravel: See Section 32 1123 for aggregate.

PART 3 EXECUTION

3.01 EXAMINATION

A. Examine site and identify existing features that contribute to erosion resistance; maintain such existing features to greatest extent possible.

3.02 PREPARATION

A. Schedule work so that soil surfaces are left exposed for the minimum amount of time.

3.03 SCOPE OF PREVENTIVE MEASURES

A. In all cases, if permanent erosion resistant measures have been installed temporary preventive measures are not required.

B. Construction Entrances: Traffic-bearing aggregate surface.
   1. Width: As required; 20 feet, minimum.
   2. Length: 50 feet, minimum.
   3. Provide at each construction entrance from public right-of-way.
   4. Where necessary to prevent tracking of mud onto right-of-way, provide wheel washing area out of direct traffic lane, with drain into sediment trap or basin.

C. Linear Sediment Barriers: Made of silt fences.
   1. Provide linear sediment barriers:
      a. Along downhill perimeter edge of disturbed areas, including soil stockpiles.

2. Space sediment barriers with the following maximum slope length upslope from barrier:
   a. Slope of Less Than 2 Percent: 100 feet..
   b. Slope Between 2 and 5 Percent: 75 feet.
   c. Slope Between 5 and 10 Percent: 50 feet.
   d. Slope Between 10 and 20 Percent: 25 feet.
   e. Slope Over 20 Percent: 15 feet.

D. Storm Drain Curb Inlet Sediment Trap: Protect each curb inlet using one of the following measures:
   1. Filter fabric wrapped around hollow concrete blocks blocking entire inlet face area; use one piece of fabric wrapped at least 1-1/2 times around concrete blocks and secured to prevent dislodging; orient cores of blocks so runoff passes into inlet.
   2. Straw bale row blocking entire inlet face area; anchor into pavement.

E. Storm Drain Drop Inlet Sediment Traps: As detailed on drawings.

F. Temporary Splash Pads: Stone aggregate over filter fabric; size to suit application; provide at downspout outlets and storm water outlets.

G. Soil Stockpiles: Protect using one of the following measures:
   1. Cover with polyethylene film, secured by placing soil on outer edges.
   2. Cover with mulch at least 4 inches thickness of pine needles, sawdust, bark, wood chips, or shredded leaves, or 6 inches of straw or hay.

H. Mulching: Use only for areas that may be subjected to erosion for less than 6 months.

I. Temporary Seeding: Use where temporary vegetated cover is required.

3.04 INSTALLATION

A. Traffic-Bearing Aggregate Surface:
   1. Excavate minimum of 6 inches.
   2. Place geotextile fabric full width and length, with minimum 12 inch overlap at joints.
   3. Place and compact at least 6 inches of 1 1/2 to 3 1/2 inch diameter stone.

B. Silt Fences:
   1. Store and handle fabric in accordance with ASTM D4873/D4873M.
   2. Where slope gradient is less than 3:1 or barriers will be in place less than 6 months, use nominal 16 inch high barriers with minimum 36 inch long posts spaced at 6 feet maximum, with fabric embedded at least 4 inches in ground.
   3. Where slope gradient is steeper than 3:1 or barriers will be in place over 6 months, use nominal 28 inch high barriers, minimum 48 inch long posts spaced at 6 feet maximum, with fabric embedded at least 6 inches in ground.
   4. Where slope gradient is steeper than 3:1 and vertical height of slope between barriers is more than 20 feet, use nominal 32 inch high barriers with woven wire reinforcement and steel posts spaced at 4 feet maximum, with fabric embedded at least 6 inches in ground.
   5. Install with top of fabric at nominal height and embedment as specified.
   6. Do not splice fabric width; minimize splices in fabric length; splice at post only, overlapping at least 18 inches, with extra post.
   7. Fasten fabric to wood posts using one of the following:
      a. Four nails per post with 3/4 inch diameter flat or button head, 1 inch long, and 14 gauge, 0.083 inch shank diameter.
      b. Five staples per post with at least 17 gauge, 0.0453 inch wire, 3/4 inch crown width and 1/2 inch long legs.
   8. Wherever runoff will flow around end of barrier or over the top, provide temporary splash pad or other outlet protection; at such outlets in the run of the barrier, make barrier not more than 12 inches high with post spacing not more than 4 feet.

C. Straw Bale Rows:
   1. Install bales in continuous rows with ends butting tightly, with one bale at each end of row turned uphill.
   2. Install bales so that bindings are not in contact with the ground.
   3. Embed bales at least 4 inches in the ground.

4. Anchor bales with at least two stakes per bale, driven at least 18 inches into the ground; drive first stake in each bale toward the previously placed bale to force bales together.
5. Fill gaps between ends of bales with loose straw wedged tightly.
6. Place soil excavated for trench against bales on the upslope side of the row, compacted.

D. Mulching Over Small and Medium Areas:
1. Dry Straw and Hay: Apply 4 to 6 inches depth.
2. Erosion Control Matting: Comply with manufacturer's instructions.

E. Temporary Seeding:
1. When hydraulic seeder is used, seedbed preparation is not required.
2. When surface soil has been sealed by rainfall or consists of smooth undisturbed cut slopes, and conventional or manual seeding is to be used, prepare seedbed by scarifying sufficiently to allow seed to lodge and germinate.
3. If temporary mulching was used on planting area but not removed, apply nitrogen fertilizer at 1 pound per 1000 sq ft.
4. On soils of very low fertility, apply 10-10-10 fertilizer at rate of 12 to 16 pounds per 1000 sq ft.
5. Incorporate fertilizer into soil before seeding.
6. Apply seed uniformly; if using drill or cultipacker seeders place seed 1/2 to 1 inch deep.
7. Irrigate as required to thoroughly wet soil to depth that will ensure germination, without causing runoff or erosion.
8. Repeat irrigation as required until grass is established.

3.05 MAINTENANCE

A. Inspect preventive measures weekly, within 24 hours after the end of any storm that produces 0.5 inches or more rainfall at the project site, and daily during prolonged rainfall.

B. Repair deficiencies immediately.

C. Silt Fences:
1. Promptly replace fabric that deteriorates unless need for fence has passed.
2. Remove silt deposits that exceed one-third of the height of the fence.
3. Repair fences that are undercut by runoff or otherwise damaged, whether by runoff or other causes.

D. Straw Bale Rows:
1. Promptly replace bales that fall apart or otherwise deteriorate unless need has passed.
2. Remove silt deposits that exceed one-half of the height of the bales.
3. Repair bale rows that are undercut by runoff or otherwise damaged, whether by runoff or other causes.

E. Clean out temporary sediment control structures weekly and relocate soil on site.

F. Place sediment in appropriate locations on site; do not remove from site.

3.06 CLEAN UP

A. Remove temporary measures after permanent measures have been installed, unless permitted to remain by Architect.

B. Clean out temporary sediment control structures that are to remain as permanent measures.

C. Where removal of temporary measures would leave exposed soil, shape surface to an acceptable grade and finish to match adjacent ground surfaces.

END OF SECTION

SECTION 01 7000
EXECUTION AND CLOSEOUT REQUIREMENTS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Examination, preparation, and general installation procedures.

B. Cutting and patching.

C. Surveying for laying out the work.

D. Cleaning and protection.

E. Closeout procedures, including Contractor's Correction Punch List, except payment procedures.

1.02 REFERENCE STANDARDS

1.03 SUBMITTALS

A. See Section 01 3000 - Administrative Requirements, for submittal procedures.

B. Survey work: Submit name, address, and telephone number of Surveyor before starting survey work.
   1. On request, submit documentation verifying accuracy of survey work.
   2. Submit a copy of site drawing signed by the Land Surveyor, that the elevations and locations of the work are in compliance with Contract Documents.
   3. Submit surveys and survey logs for the project record.

C. Cutting and Patching: Submit written request in advance of cutting or alteration that affects:
   1. Structural integrity of any element of Project.
   2. Integrity of weather exposed or moisture resistant element.
   3. Efficiency, maintenance, or safety of any operational element.
   4. Visual qualities of sight exposed elements.
   5. Work of Owner or separate Contractor.

1.04 QUALIFICATIONS

A. For surveying work, employ a land surveyor registered in the State in which the Project is located and acceptable to Architect. Submit evidence of surveyor's Errors and Omissions insurance coverage in the form of an Insurance Certificate. Employ only individual(s) trained and experienced in collecting and recording accurate data relevant to ongoing construction activities,

1.05 PROJECT CONDITIONS

A. Ventilate enclosed areas to assist cure of materials, to dissipate humidity, and to prevent accumulation of dust, fumes, vapors, or gases.

PART 2 PRODUCTS

2.01 PATCHING MATERIALS

A. New Materials: As specified in product sections; match existing products and work for patching and extending work.

B. Type and Quality of Existing Products: Determine by inspecting and testing products where necessary, referring to existing work as a standard.

C. Product Substitution: For any proposed change in materials, submit request for substitution described in Section 01 6000 - Product Requirements.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify that existing site conditions and substrate surfaces are acceptable for subsequent work. Start of work means acceptance of existing conditions.

B. Verify that existing substrate is capable of structural support or attachment of new work being applied or attached.

C. Examine and verify specific conditions described in individual specification sections.

D. Take field measurements before confirming product orders or beginning fabrication, to minimize waste due to over-ordering or misfabrication.

E. Verify that utility services are available, of the correct characteristics, and in the correct locations.

F. Prior to Cutting: Examine existing conditions prior to commencing work, including elements subject to damage or movement during cutting and patching. After uncovering existing work, assess conditions affecting performance of work. Beginning of cutting or patching means acceptance of existing conditions.

3.02 PREPARATION

A. Clean substrate surfaces prior to applying next material or substance.

B. Seal cracks or openings of substrate prior to applying next material or substance.

C. Apply manufacturer required or recommended substrate primer, sealer, or conditioner prior to applying any new material or substance in contact or bond.

3.03 LAYING OUT THE WORK

A. Verify locations of survey control points prior to starting work.

B. Promptly notify Architect of any discrepancies discovered.

C. Protect survey control points prior to starting site work; preserve permanent reference points during construction.

D. Promptly report to Architect the loss or destruction of any reference point or relocation required because of changes in grades or other reasons.

E. Replace dislocated survey control points based on original survey control. Make no changes without prior written notice to Architect.

F. Utilize recognized engineering survey practices.

G. Establish elevations, lines and levels. Locate and lay out by instrumentation and similar appropriate means:
   1. Site improvements including pavements; stakes for grading, fill and topsoil placement; utility locations, slopes, and invert elevations.
   2. Grid or axis for structures.
   3. Building foundation, column locations, ground floor elevations.

H. Periodically verify layouts by same means.

I. Maintain a complete and accurate log of control and survey work as it progresses.

3.04 GENERAL INSTALLATION REQUIREMENTS

A. Install products as specified in individual sections, in accordance with manufacturer's instructions and recommendations, and so as to avoid waste due to necessity for replacement.

B. Make vertical elements plumb and horizontal elements level, unless otherwise indicated.

C. Install equipment and fittings plumb and level, neatly aligned with adjacent vertical and horizontal lines, unless otherwise indicated.

D. Make consistent texture on surfaces, with seamless transitions, unless otherwise indicated.

E. Make neat transitions between different surfaces, maintaining texture and appearance.

3.05 CUTTING AND PATCHING

A. Whenever possible, execute the work by methods that avoid cutting or patching.

B. Perform whatever cutting and patching is necessary to:
   1. Complete the work.
   2. Fit products together to integrate with other work.
   3. Provide openings for penetration of mechanical, electrical, and other services.
   4. Match work that has been cut to adjacent work.
   5. Repair areas adjacent to cuts to required condition.
   6. Repair new work damaged by subsequent work.

7. Remove samples of installed work for testing when requested.
8. Remove and replace defective and non-complying work.

C. Execute work by methods that avoid damage to other work and that will provide appropriate surfaces to receive patching and finishing. In existing work, minimize damage and restore to original condition.

D. Employ original installer to perform cutting for weather exposed and moisture resistant elements, and sight exposed surfaces.

E. Cut rigid materials using masonry saw or core drill. Pneumatic tools not allowed without prior approval.

F. Restore work with new products in accordance with requirements of Contract Documents.

G. Fit work air tight to pipes, sleeves, ducts, conduit, and other penetrations through surfaces.

H. At penetrations of fire rated walls, partitions, ceiling, or floor construction, completely seal voids with fire rated material in accordance with Section 07 8400, to full thickness of the penetrated element.

I. Patching:
1. Finish patched surfaces to match finish that existed prior to patching. On continuous surfaces, refinish to nearest intersection or natural break. For an assembly, refinish entire unit.
2. Match color, texture, and appearance.
3. Repair patched surfaces that are damaged, lifted, discolored, or showing other imperfections due to patching work. If defects are due to condition of substrate, repair substrate prior to repairing finish.

3.06 PROGRESS CLEANING

A. Maintain areas free of waste materials, debris, and rubbish. Maintain site in a clean and orderly condition.

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

C. Broom and vacuum clean interior areas prior to start of surface finishing, and continue cleaning to eliminate dust.

D. Collect and remove waste materials, debris, and trash/rubbish from site periodically and dispose off-site; do not burn or bury.

3.07 PROTECTION OF INSTALLED WORK

A. Protect installed work from damage by construction operations.

B. Provide special protection where specified in individual specification sections.

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

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

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

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

G. Remove protective coverings when no longer needed; reuse or recycle coverings if possible.

3.08 ADJUSTING

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

3.09 FINAL CLEANING

A. Use cleaning materials that are nonhazardous.

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

C. Remove all labels that are not permanent. Do not paint or otherwise cover fire test labels or nameplates on mechanical and electrical equipment.

D. Clean equipment and fixtures to a sanitary condition with cleaning materials appropriate to the surface and material being cleaned.

E. Clean filters of operating equipment.

F. Clean debris from roofs, gutters, downspouts, scuppers, overflow drains, area drains, and drainage systems.

G. Clean site; sweep paved areas, rake clean landscaped surfaces.

H. Remove waste, surplus materials, trash/rubbish, and construction facilities from the site; dispose of in legal manner; do not burn or bury.

3.10 CLOSEOUT PROCEDURES

A. Make submittals that are required by governing or other authorities.

B. Accompany Project Coordinator on preliminary inspection to determine items to be listed for completion or correction in the Contractor's Correction Punch List for Contractor's Notice of Substantial Completion.

C. Notify Architect when work is considered ready for Architect's Substantial Completion inspection.

D. Submit written certification containing Contractor's Correction Punch List, that Contract Documents have been reviewed, work has been inspected, and that work is complete in accordance with Contract Documents and ready for Architect's Substantial Completion inspection.

E. Conduct Substantial Completion inspection and create Final Correction Punch List containing Architect's and Contractor's comprehensive list of items identified to be completed or corrected and submit to Architect.

F. Correct items of work listed in Final Correction Punch List and comply with requirements for access to Owner-occupied areas.

G. Notify Architect when work is considered finally complete and ready for Architect's Substantial Completion final inspection.

H. Complete items of work determined by Architect listed in executed Certificate of Substantial Completion.

END OF SECTION

SECTION 02 4100
DEMOLITION

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Building demolition excluding removal of hazardous materials and toxic substances.

B. Selective demolition of building elements for alteration purposes.

1.02 RELATED REQUIREMENTS

A. Section 01 1000 - Summary: Limitations on Contractor's use of site and premises.

B. Section 01 1000 - Summary: Description of items to be salvaged or removed for re-use by Contractor.

C. Section 01 5000 - Temporary Facilities and Controls: Site fences, security, protective barriers, and waste removal.

D. Section 01 6000 - Product Requirements: Handling and storage of items removed for salvage and relocation.

E. Section 01 7000 - Execution and Closeout Requirements: Project conditions; protection of bench marks, survey control points, and existing construction to remain; reinstallation of removed products; temporary bracing and shoring.

F. Section 31 2323 - Fill: Filling holes, pits, and excavations generated as a result of removal operations.

1.03 DEFINITIONS

A. Demolition: Dismantle, raze, destroy or wreck any building or structure or any part thereof.

B. Remove: Detach or dismantle items from existing construction and dispose of them off site, unless items are indicated to be salvaged or reinstalled.

C. Remove and Salvage: Detach or dismantle items from existing construction in a manner to prevent damage. Clean, package, label and deliver salvaged items to Owner in ready-for-reuse condition.

D. Remove and Reinstall: Detach or dismantle items from existing construction in a manner to prevent damage. Clean and prepare for reuse and reinstall where indicated.

E. Existing to Remain: Designation for existing items that are not to be removed and that are not otherwise indicated to be salvaged or reinstalled.

1.04 SUBMITTALS

A. See Section 01 3000 - Administrative Requirements for submittal procedures.

B. Site Plan: Indicate:
   1. Areas for temporary construction and field offices.

C. Demolition Plan: Submit demolition plan as required by OSHA and local AHJs.
   1. Indicate extent of demolition, removal sequencing, bracing and shoring, and location and construction of barricades and fences.

D. Demolition firm qualifications.

E. Project Record Documents: Accurately record actual locations of capped and active utilities and subsurface construction.

PART 2 PRODUCTS

2.01 MATERIALS

A. Fill Material: See Section 31 2323.

PART 3 EXECUTION

3.01 DEMOLITION

A. Remove other items indicated, for salvage, relocation, recycling, and [_____].

3.02 GENERAL PROCEDURES AND PROJECT CONDITIONS

A. Comply with applicable codes and regulations for demolition operations and safety of adjacent structures and the public.
   1. Obtain required permits.
   2. Take precautions to prevent catastrophic or uncontrolled collapse of structures to be removed; do not allow worker or public access within range of potential collapse of unstable structures.
   3. Provide, erect, and maintain temporary barriers and security devices.
   4. Conduct operations to minimize effects on and interference with adjacent structures and occupants.
   5. Do not close or obstruct roadways or sidewalks without permits from authority having jurisdiction.
   6. Conduct operations to minimize obstruction of public and private entrances and exits. Do not obstruct required exits at any time. Protect persons using entrances and exits from removal operations.
   7. Obtain written permission from owners of adjacent properties when demolition equipment will traverse, infringe upon, or limit access to their property.

B. Do not begin removal until receipt of notification to proceed from Owner.

C. Protect existing structures and other elements to remain in place and not removed.
   1. Provide bracing and shoring.
   2. Prevent movement or settlement of adjacent structures.
   3. Stop work immediately if adjacent structures appear to be in danger.

3.03 EXISTING UTILITIES

A. Coordinate work with utility companies. Notify utilities before starting work, comply with their requirements, and obtain required permits.

B. Protect existing utilities to remain from damage.

C. Do not disrupt public utilities without permit from authority having jurisdiction.

D. Do not close, shut off, or disrupt existing life safety systems that are in use without at least 7 days prior written notification to Owner.

E. Do not close, shut off, or disrupt existing utility branches or take-offs that are in use without at least 3 days prior written notification to Owner.

F. Locate and mark utilities to remain; mark using highly visible tags or flags, with identification of utility type; protect from damage due to subsequent construction, using substantial barricades if necessary.

G. Remove exposed piping, valves, meters, equipment, supports, and foundations of disconnected and abandoned utilities.

3.04 SELECTIVE DEMOLITION FOR ALTERATIONS

A. Existing construction and utilities indicated on drawings are based on casual field observation and existing record documents only.
   1. Verify construction and utility arrangements are as indicated.
   2. Report discrepancies to Architect before disturbing existing installation.
   3. Beginning of demolition work constitutes acceptance of existing conditions that would be apparent upon examination prior to starting demolition.

B. Remove existing work as indicated and required to accomplish new work.
   1. Remove items indicated on drawings.

C. Services including, but not limited to, Electrical: Remove existing components as indicated in the Drawings. Salvage for reinstallation. Reinstall and reconnect.
   1. Maintain existing active HVAC systems to remain in operation, and maintain access to equipment and operational components.
   2. Verify that abandoned services serve only abandoned facilities before removal.

3. Remove abandoned pipe, ducts, conduits, and equipment, including those above accessible ceilings. Remove back to source of supply where possible, otherwise cap stub and tag with identification.

D. Protect existing work to remain.
   1. Prevent movement of structure. Provide shoring and bracing as required.
   2. Perform cutting to accomplish removal work neatly and as specified for cutting new work.
   3. Repair adjacent construction and finishes damaged during removal work.
   4. Patch to match new work.

3.05 DEBRIS AND WASTE REMOVAL

A. Remove debris, junk, and trash from site.

B. Leave site in clean condition, ready for subsequent work.

C. Clean up spillage and wind-blown debris from public and private lands.

END OF SECTION

SECTION 03 0100
MAINTENANCE OF CONCRETE

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Cleaning of existing concrete surfaces.

B. Repair of exposed structural, shrinkage, and settlement cracks.

C. Resurfacing of concrete surfaces having spalled areas and other damage.

D. Scope of Work: As indicated on drawings.

1.02 RELATED REQUIREMENTS

A. Section 03 3000 - Cast-in-Place Concrete: Finishing of concrete surface to tolerance; floating, troweling, and similar operations; curing.

1.03 REFERENCE STANDARDS

A. ASTM C33/C33M - Standard Specification for Concrete Aggregates 2018.

B. ASTM C404 - Standard Specification for Aggregates for Masonry Grout 2018.

C. ASTM C928/C928M - Standard Specification for Packaged, Dry, Rapid-Hardening Cementitious Materials for Concrete Repairs 2020a.

D. ASTM C1059/C1059M - Standard Specification for Latex Agents for Bonding Fresh to Hardened Concrete 2021.

E. ICRI 310.2R - Selecting and Specifying Concrete Surface Preparation for Sealers, Coatings, Polymer Overlays, and Concrete Repair 2013.

1.04 ADMINISTRATIVE REQUIREMENTS

1.05 SUBMITTALS

A. See Section 01 3000 - Administrative Requirements, for submittal procedures.

B. Product Data: Indicate product standards, physical and chemical characteristics, technical specifications, limitations, maintenance instructions, and general recommendations regarding each material.

C. Manufacturer's instructions.

1.06 QUALITY ASSURANCE

A. Manufacturer Qualifications: Company specializing in manufacturing products specified in this section, with not less than three years of documented experience.

B. Cleaner Qualifications: Company specializing in, and with minimum of 3 years of experience in, the type of cleaning specified.

C. Installer Qualifications: Company specializing in performing work of the type specified and with minimum of 3 years of documented experience.

1.07 DELIVERY, STORAGE, AND HANDLING

A. Comply with manufacturers' instructions for storage, shelf life limitations, and handling of products.

B. Deliver polymer resin materials in original factory-sealed containers with manufacturer's labels intact and legible. Verify product nomenclature, manufacturer's name, product identification, batch number, date of manufacture, and shelf life or expiration date. Do not use polymer resin materials that have exceeded shelf life.

C. Store materials in covered, well-ventilated area and according to manufacturer's written storage instructions. Store polymer resins and hardeners separate from construction materials that can absorb odors.

PART 2 PRODUCTS

2.01 CLEANING MATERIALS

A. Degreaser:

1. Manufacturers:
    a. Euclid Chemical Company; Euco Clean and Strip: www.euclidchemical.com/#sle.
    b. L&M Construction Chemicals, Inc, a subsidiary of Laticrete International, Inc; CITREX: www.lmcc.com/#sle.
    c. Nox-Crete, Inc; Bio-Clean Plus: www.nox-crete.com/#sle.
    d. SpecChem, LLC; Orange Peel-Citrus Cleaner: www.specchemllc.com/#sle.
    e. W. R. Meadows, Inc: www.wrmeadows.com/#sle.
    f. Substitutions: See Section 01 6000 - Product Requirements.

B. Detergent: Non-ionic detergent.

C. Acidic Cleaning Agent:
1. Manufacturers:
    a. United Gilsonite Laboratories; DRYLOK® Concrete and Masonry Etch and Cleaner: www.ugl.com/#sle.

D. Strippers and Cleaners for Removal of Existing Coatings:
1. Manufacturers:
    a. Nox-Crete, Inc; Deco-Strip Series: www.nox-crete.com/#sle.
    b. Nox-Crete, Inc; Deco-Peel Series: www.nox-crete.com/#sle.

2.02 CEMENTITIOUS PATCHING AND REPAIR MATERIALS

A. Manufacturers:

B. Bonding Slurry: Water-based latex admixture; comply with ASTM C1059/C1059M, combined with Portland cement and sand in accordance with admixture manufacturer's instructions.
1. Admixture Manufacturers:
    a. Euclid Chemical Company; AKKRO-7T: www.euclidchemical.com/#sle.
    b. Mapei Corporation; Planibond 3C: www.mapei.com/#sle.
    c. SpecChem, LLC; Strong Bond - Acrylic Bonder: www.specchemllc.com/#sle.
    d. W. R. Meadows, Inc; Acry-lok: www.wrmeadows.com/#sle.
    e. Substitutions: See Section 01 6000 - Product Requirements.

C. Cementitious Resurfacing Mortar: One- or two-component, factory-mixed, polymer-modified cementitious mortar designed for continuous thin-coat application.
1. In-place material resistant to freeze/thaw conditions.
2. Mixed with water or latex type bonding agent in proportions as recommended by manufacturer.
3. Integral corrosion inhibitor.
4. Recommended Thickness: Feather edge to 1/8 inch.
5. Color: Gray.
6. Manufacturers:
    a. SILPRO Corporation; Raeco Skimwall: www.silpro.com/#sle.
    b. Mapei Corporation; Planitop 12 SR: www.mapei.com/#sle.
    c. SpecChem, LLC: Duo Patch: www.specchemllc.com/#sle.
    d. Xypex Chemical Corporation; XYPEX Megamix II: www.xypex.com/#sle.
    e. Substitutions: See Section 01 6000 - Product Requirements.

D. Cementitious Repair Mortar, Trowel Grade: One- or two-component, factory-mixed, polymer-modified cementitious mortar.
1. In-place material resistant to freeze/thaw conditions.
2. Mixed with water or latex type bonding agent in proportions as recommended by manufacturer.
3. Dry Material: Complies with ASTM C928/C928M.
4. Integral corrosion inhibitor.
5. Manufacturers:
    a. Koster American Corporation: www.kosterusa.com/#sle.
    b. SILPRO Corporation; TDQ: www.silpro.com/#sle.
    c. SILPRO Corporation; SkimWall: www.silpro.com/#sle.

d. SILPRO Corporation; SilPro Repair VOH: www.silpro.com/#sle.
e. SILPRO Corporation; SilPro Rapid: www.silpro.com/#sle.
f. W. R. Meadows, Inc; Meadow-Crete GPS: www.wrmeadows.com/#sle.
g. Substitutions: See Section 01 6000 - Product Requirements.

2.03 ACCESSORIES

A. Portland Cement: ASTM C150/C150M, Type I, grey.

B. Sand: ASTM C33/C33M or ASTM C404; uniformly graded, clean.

C. Water: Clean and potable.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify that surfaces are ready to receive work as per manufacturer's recommendations.

B. Beginning of installation means acceptance of substrate.

3.02 PREPARATION

A. Prepare concrete surfaces to be repaired according to manufacturers recommendations.

3.03 CLEANING EXISTING CONCRETE

A. Provide enclosures, barricades, and other temporary construction as required to protect adjacent work from damage.

B. Clean concrete surfaces of dirt or other contamination using the gentlest method that is effective.
1. Try the gentlest method first, then, if not clean enough, use a less gentle method taking care to watch for impending damage.
2. Clean out cracks and voids using same methods.

C. The following are acceptable cleaning methods, in order from gentlest to less gentle:
1. Water washing using low-pressure, maximum of 100 psi, and, if necessary, brushes with natural or synthetic bristles.
2. Increasing the water washing pressure to maximum of 400 psi.
3. Adding detergent to washing water; with final water rinse to remove residual detergent.
4. Steam-generated low-pressure hot-water washing.
5. Alkaline cleaning agent applied for the least amount of time that is effective, followed by slight acid rinse and water rinse.
6. Acidic cleaning agent applied for the least amount of time that is effective, followed by water rinse. Test acidic cleaning agents on mock-up surfaces prior to use.
7. Abrasive blasting: Use only abrasive media that have been proven not to damage concrete by testing on mock-up.

D. Do not use any of the following cleaning methods, unless otherwise indicated:
1. Brushes with wire bristles, grinding with abrasives, solvents, hydrochloric or muriatic acid, sodium hydroxide, caustic soda, or lye.
2. Soap or detergent that is not non-ionic.

3.04 CONCRETE SURFACE REPAIR USING CEMENTITIOUS MATERIALS

A. Clean concrete surfaces, cracks, and joints of dirt, laitance, corrosion, and other contamination using method(s) specified above and allow to dry.

B. Follow bonding agent and repair mortar manufacturer's written installation instructions.

C. Apply coating of bonding agent to entire concrete surface to be repaired.

D. Fill voids with cementitious mortar flush with surface.

E. Apply repair mortar by steel trowel to a minimum thickness of 1/4 inch over entire surface, terminating at a vertical change in plane on all sides.

F. Trowel finish to match adjacent concrete surfaces.

END OF SECTION

SECTION 03 3000
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 01 Specification Sections, apply to this Section.

1.02 SUMMARY

A. Section Includes:
   1. Cast-in-place concrete, including concrete materials, mixture design, placement procedures, and finishes.

1.03 DEFINITIONS

A. Cementitious Materials: Portland cement alone or in combination with one or more of the following: blended hydraulic cement, fly ash, slag cement, other pozzolans, and silica fume; materials subject to compliance with requirements.

B. Water/Cement Ratio (w/cm): The ratio by weight of water to cementitious materials.

1.04 PREINSTALLATION MEETINGS

A. Preinstallation Conference: Conduct conference conducted virtually.
   1. Require representatives of each entity directly concerned with cast-in-place concrete to attend, including the following:
      a. Contractor's superintendent.
      b. Independent testing agency responsible for concrete design mixtures.
      c. Ready-mix concrete manufacturer.
      d. Concrete Subcontractor.
   2. Review the following:
      a. Special inspection and testing and inspecting agency procedures for field quality control.
      b. Construction joints, control joints, isolation joints, and joint-filler strips.
      c. Semirigid joint fillers.
      d. Vapor-retarder installation.
      e. Anchor rod and anchorage device installation tolerances.
      f. Cold and hot weather concreting procedures.
      g. Concrete finishes and finishing.
      h. Curing procedures.
      i. Forms and form-removal limitations.
      j. Methods for achieving specified floor and slab flatness and levelness.
      k. Concrete repair procedures.
      l. Concrete protection.
      m. Initial curing and field curing of field test cylinders (ASTM C31/C31M.)
      n. Protection of field cured field test cylinders.

1.05 ACTION SUBMITTALS

A. Product Data: For each of the following.
   1. Portland cement.
   2. Fly ash.

3. Aggregates.
4. Admixtures:
    a. Include limitations of use, including restrictions on cementitious materials, supplementary cementitious materials, air entrainment, aggregates, temperature at time of concrete placement, relative humidity at time of concrete placement, curing conditions, and use of other admixtures.
5. Vapor retarders.
6. Floor and slab treatments.
7. Curing materials.
8. Joint fillers.
9. Repair materials.

B. Design Mixtures: For each concrete mixture, include the following:
1. Mixture identification and intended location of placement.
2. Minimum 28-day compressive strength.
3. Proportions of ingredients used for the composition of design mixtures.
4. Durability exposure class.
5. Maximum w/cm.
6. Slump limit.
7. Air content.
8. Nominal maximum aggregate size.
9. Dosage of Admixture
10. Indicate amounts of mixing water to be withheld for later addition at Project site if permitted.
11. Documentation of average strength
12. Intended placement method.
13. Submit alternate design mixtures when characteristics of materials, Project conditions, weather, test results, or other circumstances warrant adjustments.

C. Shop Drawings:
1. Construction Joint Layout: Indicate proposed construction joints required to construct the structure.
    a. Location of construction joints is subject to approval of the Architect and Structural Engineer of Record.

D. Concrete Schedule: For each location of each Class of concrete indicated in "Concrete Mixtures" Article, including the following:
1. Concrete Class designation.
2. Location within Project.
3. Exposure Class designation.
4. Formed Surface Finish designation and final finish.
5. Final finish for floors.
6. Curing process.
7. Floor treatment if any.

1.06 INFORMATIONAL SUBMITTALS

A. Qualification Data: For the following:
1. Installer: Include copies of applicable ACI certificates.

2. Ready-mixed concrete manufacturer.
3. Testing agency: Include copies of applicable ACI certificates.

B. Material Certificates: For each of the following, signed by manufacturers:
1. Cementitious materials.
2. Admixtures.
3. Curing compounds.
4. Floor and slab treatments.
5. Bonding agents.
6. Adhesives.
7. Vapor retarders.
8. Semirigid joint filler.
9. Joint-filler strips.
10. Repair materials.

C. Material Test Reports: For the following, from a qualified testing agency:
1. Portland cement.
2. Fly ash.
3. Aggregates.
4. Admixtures

D. Research Reports:
1. For concrete admixtures in accordance with ICC's Acceptance Criteria AC198.
2. For sheet vapor retarder/termite barrier, showing compliance with ICC AC380.

E. Preconstruction Test Reports: For each mix design.

F. Field quality-control reports.

G. Minutes of preinstallation conference.

1.07 QUALITY ASSURANCE

A. Installer Qualifications:
1. Post-Installed Concrete Anchors Installers: ACI-certified Adhesive Anchor Installer.

B. Ready-Mixed Concrete Manufacturer Qualifications: A firm experienced in manufacturing ready-mixed concrete products and that complies with ASTM C94/C94M requirements for production facilities and equipment.
1. Manufacturer certified in accordance with NRMCA's "Certification of Ready Mixed Concrete Production Facilities."

C. Laboratory Testing Agency Qualifications: A testing agency qualified in accordance with ASTM C1077 and ASTM E329 for testing indicated and employing an ACI-certified Concrete Quality Control Technical Manager.
1. Personnel performing laboratory tests shall be an ACI-certified Concrete Strength Testing Technician and Concrete Laboratory Testing Technician, Grade I. Testing agency laboratory supervisor shall be an ACI-certified Concrete Laboratory Testing Technician, Grade II.

D. Field Quality Control Testing Agency Qualifications: An independent agency, qualified in accordance with ASTM C1077 and ASTM E329 for testing indicated.
1. Personnel conducting field tests shall be qualified as an ACI Concrete Field Testing Technician, Grade 1, in accordance with ACI CPP 610.1 or an equivalent certification program.

1.08 DELIVERY, STORAGE, AND HANDLING

A. Comply with ASTM C94/C94M and ACI 301.

B. Concrete supplier shall have sufficient capacity and adequate facilities to provide continuous delivery at the rate required for continuous placement throughout any sequence of placement.

C. Storage of Concrete Materials:

1. Store cement in weather tight buildings or bins which prevent intrusion of moisture or contaminants. Store different types of cement in separate facilities.
2. Stockpile aggregates to prevent segregation and contamination with other materials. Thaw frozen aggregates before use.
3. Sand shall be drained to a uniform moisture content before use.
4. Store admixtures securely to prevent contamination, evaporation damage or temperature variation in excesses of the range recommended by the manufacturer.

1.09 FIELD CONDITIONS

A. Cold-Weather Placement: Comply with ACI 301 and ACI 306.1 and as follows.

1. Protect concrete work from physical damage or reduced strength that could be caused by frost, freezing actions, or low temperatures.
2. When average high and low temperature is expected to fall below 40 deg F for three successive days, maintain delivered concrete mixture temperature within the temperature range required by ACI 301.
3. Do not use frozen materials or materials containing ice or snow.
4. Do not place concrete in contact with surfaces less than 35 deg F, other than reinforcing steel.
5. Do not use calcium chloride, salt, or other materials containing antifreeze agents or chemical accelerators unless otherwise specified and approved in mixture designs.

B. Hot-Weather Placement: Comply with ACI 301 and ACI 305.1, and as follows:

1. Maintain concrete temperature at time of discharge to not exceed 95 deg F.
2. Fog-spray forms, steel reinforcement, and subgrade just before placing concrete. Keep subgrade uniformly moist without standing water, soft spots, or dry areas.

1.010 WARRANTY

A. Manufacturer's Warranty: Manufacturer agrees to furnish replacement sheet vapor retarder/termite barrier material and accessories for sheet vapor retarder/ termite barrier and accessories that do not comply with requirements or that fail to resist penetration by termites within specified warranty period.

1. Warranty Period: 10 years from date of Substantial Completion.

PART 2 - PRODUCTS

2.01 CONCRETE, GENERAL

A. ACI Publications: Comply with ACI 301 unless modified by requirements in the Contract Documents.

2.02 CONCRETE MATERIALS

A. Source Limitations:

1. Obtain all concrete mixtures from a single ready-mixed concrete manufacturer for entire Project.
2. Obtain each type or class of cementitious material of the same brand from the same manufacturer's plant.

3. Obtain aggregate from single source.
4. Obtain each type of admixture from single source from single manufacturer.

B. Cementitious Materials:

1. Portland Cement: ASTM C150/C150M, Type I, gray Retain supplementary cementing materials in "Fly Ash" and "Slag Cement" subparagraphs below. Ready-mix-concrete manufacturer blends these materials with portland cement. Fly ash, slag cement, or pozzolanic materials may slow rate of concrete strengthening and affect color uniformity.
2. Fly Ash: ASTM C618, Class C or F. Use only one type and source throughout the project
3. Slag Cement: ASTM C989/C989M, Grade 100 or 120.
4. Silica Fume: ASTM C1240 amorphous silica.

C. Normal-Weight Aggregates: ASTM C33/C33M, Class 3S coarse aggregate or better, graded. Provide aggregates from a single source.

1. Alkali-Silica Reaction: Comply with one of the following:
   a. Expansion Result of Aggregate: Not more than 0.04 percent at one-year when tested in accordance with ASTM C1293.
   b. Expansion Results of Aggregate and Cementitious Materials in Combination: Not more than 0.10 percent at an age of 16 days when tested in accordance with ASTM C1567.
   c. Alkali Content in Concrete: Not more than 4 lb./cu. yd. for moderately reactive aggregate or 3 lb./cu. yd. for highly reactive aggregate, when tested in accordance with ASTM C1293 and categorized in accordance with ASTM C1778, based on alkali content being calculated in accordance with ACI 301.
2. Maximum Coarse-Aggregate Size: 1 inch nominal
3. Fine Aggregate: Free of materials with deleterious reactivity to alkali in cement.

D. Air-Entraining Admixture: ASTM C260/C260M.

E. Chemical Admixtures: Certified by manufacturer to be compatible with other admixtures that do not contribute water-soluble chloride ions exceeding those permitted in hardened concrete. Do not use calcium chloride or admixtures containing calcium chloride.

1. Water-Reducing Admixture: ASTM C494/C494M, Type A.
2. Retarding Admixture: ASTM C494/C494M, Type B.
3. Water-Reducing and -Retarding Admixture: ASTM C494/C494M, Type D.
4. High-Range, Water-Reducing Admixture: ASTM C494/C494M, Type F.
5. High-Range, Water-Reducing and -Retarding Admixture: ASTM C494/C494M, Type G.
6. Plasticizing and Retarding Admixture: ASTM C1017/C1017M, Type II.
7. Set-Accelerating Corrosion-Inhibiting Admixture: Commercially formulated, anodic inhibitor or mixed cathodic and anodic inhibitor; capable of forming a protective barrier and minimizing chloride reactions with steel reinforcement in concrete and complying with ASTM C494/C494M, Type C.
8. Non-Set-Accelerating Corrosion-Inhibiting Admixture: Commercially formulated, non-set-accelerating, anodic inhibitor or mixed cathodic and anodic inhibitor; capable of forming a protective barrier and minimizing chloride reactions with steel reinforcement in concrete.
9. Permeability-Reducing Admixture: ASTM C494/C494M, Type S, hydrophilic, permeability-reducing crystalline admixture, capable of reducing water absorption of concrete exposed to hydrostatic pressure (PRAH).

a. Permeability: No leakage when tested in accordance with U.S. Army Corps of Engineers CRD C48 at a hydraulic pressure of 200 psi for 14 days.

10. Moisture-Reducing Admixture:

a. Non-toxic, volatile organic compound (VOC) free, liquid admixture formulated to react with hydroxide ions produced by cement hydration process, creating additional hydration products within capillary pores, blocking moisture vapor movement through concrete

b. Physical characteristics:

1) Hydraulic conductivity: Project specific maximum of 6.0 E-8 cm/s per ASTM D5084.

2) Toxicity: None.

3) Odor: None.

4) Flammability: None.

5) Volatile Organic Compound (VOC) content: 0 grams per liter.

6) Freeze temperature: 32 degrees F (0 degrees C).

7) pH: 11.3

c. Add admixture per manufacturer's instructions.

d. Use with firm experienced in manufacture of concrete MVRA.

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

1) VaporLock 20/20

2) ISE Logik MVRA 900

3) Barrier One

4) Xypex

F. Water and Water Used to Make Ice: ASTM C94/C94M, potable

2.03 VAPOR RETARDERS

A. Sheet Vapor Retarder, Class A: ASTM E1745, Class A, single or multilayer, not less than 15 mils thick. Include manufacturer's recommended adhesive or pressure-sensitive tape.

B. Sheet Vapor Retarder/Termite Barrier: ASTM E1745, Class A, except with maximum water-vapor permeance of 0.01 perms per ASTM E96 or F1249; Include manufacturer's recommended adhesive or pressure-sensitive tape.

1. Low-Temperature Flexibility: Pass at minus 15 deg F; ASTM D146/D146M.

2. Puncture Resistance: 2200g minimum; ASTM D1709, B.

3. Water Absorption: 0.1 percent weight-gain maximum after 48-hour immersion at 70 deg F; ASTM D570.

4. Hydrostatic-Head Resistance: 231 feet minimum; ASTM D5385.

5. Products: Subject to Compliance with requirements, available products that may be incorporated into the Work include, but are not limited to, the following:

a. Vapor Block 15; Raven Industries Inc.

b. Stego Wrap 15 mil; Stego Industries, LLC

c. Moistop Ultra 15; Fortifiber Corporation.

C. Granular Fill: Clean mixture of crushed stone or crushed or uncrushed gravel; ASTM D 448, Size 57, with 100 percent passing a 1-1/2-inch sieve and 0 to 5 percent passing a No. 8 sieve.

D. Fine-Graded Granular Material: Clean mixture of crushed stone, crushed gravel, and manufactured or natural sand; ASTM D 448, Size 10, with 100 percent passing a 3/8-inch sieve, 10 to 30 percent passing a No. 100 sieve, and at least 5 percent passing No. 200 sieve; complying with deleterious substance limits of ASTM C 33 for fine aggregates.

2.04 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. when dry.

C. Moisture-Retaining Cover: ASTM C171, polyethylene film burlap-polyethylene sheet.

1. Color:
   a. Ambient Temperature Below 50 deg F: Black.
   b. Ambient Temperature between 50 deg F and 85 deg F: Any color.
   c. Ambient Temperature Above 85 deg F: White.

D. Curing Paper: Eight-feet-wide paper, consisting of two layers of fibered kraft paper laminated with double coating of asphalt.

E. Water: Potable or complying with ASTM C1602/C1602M.

F. Clear, Waterborne, Membrane-Forming, Dissipating Curing Compound: ASTM C309, Type 1, Class B.

G. Clear, Waterborne, Membrane-Forming, Nondissipating Curing Compound: ASTM C309, Type 1, Class B**,** certified by curing compound manufacturer to not interfere with bonding of floor covering.

H. Clear, Waterborne, Membrane-Forming, Curing Compound: ASTM C309, Type 1, Class B, 18 to 25 percent solids, nondissipating**,** certified by curing compound manufacturer to not interfere with bonding of floor covering.

I. Clear, Solvent-Borne, Membrane-Forming, Curing and Sealing Compound: ASTM C1315, Type 1, Class A.

J. Clear, Waterborne, Membrane-Forming, Curing and Sealing Compound: ASTM C1315, Type 1, Class A.

2.05 RELATED MATERIALS

A. Expansion- and Isolation-Joint-Filler Strips: ASTM D1751, asphalt-saturated cellulosic fiber

B. Semirigid Joint Filler: Two-component, semirigid, 100 percent solids, in accordance with ASTM D2240.

C. Bonding Agent: ASTM C1059/C1059M, Type II, nonredispersible, acrylic emulsion or styrene butadiene.

D. Epoxy Bonding Adhesive: ASTM C881, two-component epoxy resin, capable of humid curing and bonding to damp surfaces, of class suitable for application temperature and of grade and class to suit requirements, and as follows:

1. Types IV and V, load bearing, for bonding hardened or freshly mixed concrete to hardened concrete.

2.06 REPAIR MATERIALS.

A. Repair Underlayment: Cement-based, polymer-modified, self-leveling product that can be applied in thicknesses from 1/8 inch and that can be feathered at edges to match adjacent floor elevations.

1. Cement Binder: ASTM C150/C150M portland cement or hydraulic or blended hydraulic cement, as defined in ASTM C219.
2. Primer: Product of underlayment manufacturer recommended for substrate, conditions, and application.
3. Aggregate: Well-graded, washed gravel, 1/8 to 1/4 inch or coarse sand, as recommended by underlayment manufacturer.
4. Compressive Strength: Not less than 5000 psi at 28 days when tested in accordance with ASTM C109/C109M.

B. Repair Overlayment: Cement-based, polymer-modified, self-leveling product that can be applied in thicknesses from 1/4 inch and that can be filled in over a scarified surface to match adjacent floor elevations.

1. Cement Binder: ASTM C150/C150M portland cement or hydraulic or blended hydraulic cement, as defined in ASTM C219.
2. Primer: Product of topping manufacturer recommended for substrate, conditions, and application.
3. Aggregate: Well-graded, washed gravel, 1/8 to 1/4 inch or coarse sand as recommended by topping manufacturer.
4. Compressive Strength: Not less than 5000 psi at 28 days when tested in accordance with ASTM C109/C109M.

2.07 CONCRETE MIXTURES, GENERAL

A. Prepare design mixtures for each type and strength of concrete, proportioned on the basis of laboratory trial mixture or field test data, or both, in accordance with ACI 301.

1. Use a qualified testing agency for preparing and reporting proposed mixture designs, based on laboratory trial mixtures.
2. Required Average Strength for each type of concrete:
   a. Where suitable test records for the concrete production facility are available, design strength may be tested on the standard deviation in accordance with ACI 318.
   b. Where strength test records are not available, design strength and documentation of average strength as noted in ACI 318, Chapter 5.

B. Cementitious Materials: Limit percentage, by weight, of cementitious materials other than portland cement in concrete as follows, unless noted otherwise in specific concrete mix design specification:

1. Fly Ash or Other Pozzolans: 25 percent by mass.
2. Slag Cement: 50 percent by mass.
3. Silica Fume: 10 percent by mass.
4. Total of Fly Ash or Other Pozzolans, Slag Cement, and Silica Fume: 50 percent by mass, with fly ash or pozzolans not exceeding 25 percent by mass and silica fume not exceeding 10 percent by mass.
5. Total of Fly Ash or Other Pozzolans and Silica Fume: 35 percent by mass with fly ash or pozzolans not exceeding 25 percent by mass and silica fume not exceeding 10 percent by mass.

C. Admixtures: Use admixtures in accordance with manufacturer's written instructions.

1. Use water-reducing or high-range water-reducing or plasticizing admixture 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, and concrete with a w/cm below 0.50.
4. Slump limits noted are prior to adding water-reducing admixtures. Slump limits shall be no more than 8 inches after adding water-reducing admixtures.
5. Use corrosion-inhibiting admixture in concrete mixtures where indicated.
6. Use permeability-reducing admixture in concrete mixtures where indicated.
7. Use moisture-reducing admixture in concrete mixtures where indicated.

2.08 CONCRETE MIXTURES

A. Class B: Normal-weight concrete used for footings, slabs and foundation walls.
1. Exposure Class: ACI 318 F1
2. Minimum Compressive Strength: 4000 psi at 28 days.
3. Maximum w/cm: 0.45.
4. Maximum Coarse-Aggregate Size: 1 inch nominal.
5. Slump Limit: 4 inches, plus or minus 1 inch
6. Air Content:
   a. For Exterior Exposure Class F1: 4.5 percent, plus or minus 1.5 percent at point of delivery for concrete containing 1-inch nominal maximum aggregate size
7. Limit water-soluble, chloride-ion content in hardened concrete to 0.30 percent by weight of cement.

B. Class J: Normal-weight concrete used for Exterior Structural Concrete.
1. Exposure Class: ACI 318 F3
2. Minimum Compressive Strength: 4500 psi at 28 days.
3. Maximum w/cm: 0.45
4. Maximum Coarse-Aggregate Size: 1 inch nominal
5. Slump Limit: 4 inches, plus or minus 1 inch
6. Air Content:
   a. Exposure Classes F2 and F3: 6 percent, plus or minus 1.5 percent at point of delivery for concrete containing 1-inch nominal maximum aggregate size
7. Limit water-soluble, chloride-ion content in hardened concrete to 0.30 percent by weight of cement.

2.09 CONCRETE MIXING

A. Ready-Mixed Concrete: Measure, batch, mix, and deliver concrete in accordance with ASTM C94/C94M and furnish batch ticket information.
1. When air temperature is between 85 and 90 deg F, reduce mixing and delivery time from 1-1/2 hours to 75 minutes; when air temperature is above 90 deg F, reduce mixing and delivery time to 60 minutes.

B. Project-Site Mixing: Measure, batch, and mix concrete materials and concrete in accordance with ASTM C94/C94M. Mix concrete materials in appropriate drum-type batch machine mixer.
1. For mixer capacity of 1 cu. yd. or smaller, continue mixing at least 1-1/2 minutes, but not more than five minutes after ingredients are in mixer, before any part of batch is released.
2. For mixer capacity larger than 1 cu. yd., increase mixing time by 15 seconds for each additional 1 cu. yd..

3. Provide batch ticket for each batch discharged and used in the Work, indicating Project identification name and number, date, mixture type, mixture time, quantity, and amount of water added. Record approximate location of final deposit in structure.

PART 3 - EXECUTION

3.01 EXAMINATION

A. Verification of Conditions:

1. Before placing concrete, verify that installation of concrete forms, accessories, and reinforcement, and embedded items is complete and that required inspections have been performed.
2. Do not proceed until unsatisfactory conditions have been corrected.

3.02 PREPARATION

A. Provide reasonable auxiliary services to accommodate field testing and inspections, acceptable to testing agency, including the following:

1. Daily access to the Work.
2. Incidental labor and facilities necessary to facilitate tests and inspections.
3. Secure space for storage, initial curing, and field curing of test samples, including source of water and continuous electrical power at Project site during site curing period for test samples.
4. Security and protection for test samples and for testing and inspection equipment at Project site.

3.03 INSTALLATION OF 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.

1. Use setting drawings, templates, diagrams, instructions, and directions furnished with items to be embedded.
2. Install anchor rods, accurately located, to elevations required and complying with tolerances in Section 7.5 of ANSI/AISC 303.
3. Install reglets to receive 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.

3.04 INSTALLATION OF VAPOR RETARDER

A. Sheet Vapor Retarders: Place, protect, and repair sheet vapor retarder in accordance with ASTM E1643 and manufacturer's written instructions.

1. Install vapor retarder with longest dimension parallel with direction of concrete pour.
2. Face laps away from exposed direction of concrete pour.
3. Lap vapor retarder over footings and grade beams not less than 6 inches, sealing vapor retarder to concrete.
4. Lap joints 6 inches and seal with manufacturer's recommended tape.
5. Terminate vapor retarder at the top of floor slabs, grade beams, and pile caps, sealing entire perimeter to floor slabs, grade beams, foundation walls, or pile caps.
6. Seal penetrations in accordance with vapor retarder manufacturer's instructions.
7. Protect vapor retarder during placement of reinforcement and concrete.
    a. Repair damaged areas by patching with vapor retarder material, overlapping damages area by 6 inches on all sides, and sealing to vapor retarder.

B. Bituminous Vapor Retarders: Place, protect, and repair bituminous vapor retarder in accordance with manufacturer's written instructions.

3.05 JOINTS

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

B. Construction Joints: Coordinate with floor slab pattern and concrete placement sequence.

1. Install so strength and appearance of concrete are not impaired, at locations indicated on Drawings or as approved by Architect or Structural Engineer of Record.
2. Place joints perpendicular to main reinforcement.
    a. Continue reinforcement across construction joints unless otherwise indicated.
    b. Do not continue reinforcement through sides of strip placements of floors and slabs.
3. Form keyed joints as indicated. Embed keys at least 1-1/2 inches into concrete.
4. Locate joints for beams, slabs, joists, and girders at third points of spans. Offset joints in girders a minimum distance of twice the beam width from a beam-girder intersection.
5. Locate horizontal joints in walls and columns at underside of floors, slabs, beams, and girders and at the top of footings or floor slabs.
6. Use a bonding agent at locations where fresh concrete is placed against hardened or partially hardened concrete surfaces.
7. Use epoxy-bonding adhesive at locations where fresh concrete is placed against hardened or partially hardened concrete surfaces.

C. Control Joints in Slabs-on-Ground: Form weakened-plane control joints, sectioning concrete into areas as indicated. Construct control joints for a depth equal to at least one-fourth of concrete thickness as follows:

1. Grooved Joints: Form control joints after initial floating by grooving and finishing each edge of joint to a radius of 1/8 inch. Repeat grooving of control joints after applying surface finishes. Eliminate groover tool marks on concrete surfaces.
2. Sawed Joints:
    a. Primary Method: Soft-Cut System method, by Soff-Cut International, Corona, CA (800) 776-3328. Finisher must have documented successful experience in the use of this method prior to this project. Install cuts within 2 hours after final finish at each saw cut location.
    b. Optional Method (Where Soft-Cut System Method Equipment is Not Available): Form control joints with power saws equipped with shatterproof abrasive or diamond-rimmed blades. Cut 1/8-inch-wide joints into concrete when cutting action does not tear, abrade, or otherwise damage surface and before concrete develops random cracks. Properly time cutting with the set of the concrete. Saw-Cut control joints within 12 hours after finishing. Complete cutting before shrinkage stresses become sufficient to produce cracking.
3. Spacing: Provide joints at locations as noted on Contract Drawings.
    a. Placement of saw joints must be coordinated with the tile joints and this requirement governs over locations shown on the Contract Drawings.

D. Isolation Joints in Slabs-on-Ground: 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 on Drawings.
2. Terminate full-width joint-filler strips not less than 1/2 inch or more than 1 inch below finished concrete surface, where joint sealants, specified in Section 079200 "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.

E. Doweled Joints:

1. Install dowel bars and support assemblies at joints where indicated on Drawings.

3.06 CONCRETE PLACEMENT

A. Before placing concrete, verify that installation of formwork, reinforcement, embedded items, and vapor retarder is complete and that required inspections are completed.

1. Immediately prior to concrete placement, inspect vapor retarder for damage and deficient installation, and repair defective areas.
2. Provide continuous inspection of vapor retarder during concrete placement and make necessary repairs to damaged areas as Work progresses.

B. Notify Architect and testing and inspection agencies 24 hours prior to commencement of concrete placement.

C. Do not add water to concrete during delivery, at Project site, or during placement unless approved by Architect or Structural Engineer of Record in writing, but not to exceed the amount indicated on the concrete delivery ticket.

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

D. Before test sampling and placing concrete, water may be added at Project site, subject to limitations of ACI 301, but not to exceed the amount indicated on the concrete delivery ticket.

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

E. Deposit concrete continuously in one layer or in horizontal layers of such thickness that no new concrete is placed on concrete that has hardened enough to cause seams or planes of weakness.

1. If a section cannot be placed continuously, provide construction joints as indicated.
2. Deposit concrete to avoid segregation.
3. Deposit concrete in horizontal layers of depth not to exceed formwork design pressures and in a manner to avoid inclined construction joints.
4. Consolidate placed concrete with mechanical vibrating equipment in accordance with ACI 301.
    a. Do not use vibrators to transport concrete inside forms.
    b. Insert and withdraw vibrators vertically at uniformly spaced locations to rapidly penetrate placed layer and at least 6 inches into preceding layer.
    c. Do not insert vibrators into lower layers of concrete that have begun to lose plasticity.
    d. At each insertion, limit duration of vibration to time necessary to consolidate concrete, and complete embedment of reinforcement and other embedded items without causing mixture 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. Do not place concrete floors and slabs in a checkerboard sequence.
2. Consolidate concrete during placement operations, so concrete is thoroughly worked around reinforcement and other embedded items and into corners.
3. Maintain reinforcement in position on chairs during concrete placement.
4. Screed slab surfaces with a straightedge and strike off to correct elevations.

5. Level concrete, cut high areas, and fill low areas.
6. Slope surfaces uniformly to drains where required. Confirm with Architect and Structural Engineer of Record before proceeding with a specific slope or on exterior concrete without a specific slope.
7. Begin initial floating using bull floats or darbies to form a uniform and open-textured surface plane, before excess bleedwater appears on the surface.
8. Do not further disturb slab surfaces before starting finishing operations.

3.07 FINISHING FORMED SURFACES

A. As-Cast Surface Finishes:

1. ACI 301 Surface Finish SF-1.0: As-cast concrete texture imparted by form-facing material.
   a. Patch voids larger than 1-1/2 inches wide or 1/2 inch deep.
   b. Remove projections larger than 1 inch.
   c. Tie holes do not require patching.
   d. Surface Tolerance: ACI 117 Class D.
   e. Apply to concrete surfaces not exposed to public view.
2. ACI 301 Surface Finish SF-2.0: As-cast concrete texture imparted by form-facing material, arranged in an orderly and symmetrical manner with a minimum of seams.
   a. Patch voids larger than 3/4 inch wide or 1/2 inch deep.
   b. Remove projections larger than 1/4 inch.
   c. Patch tie holes.
   d. Surface Tolerance: ACI 117 Class B.
   e. Locations: Apply to concrete surfaces exposed to public view, to receive a rubbed finish, or to be covered with a coating or covering material applied directly to concrete.

B. Related Unformed Surfaces:

1. At tops of walls, horizontal offsets, and similar unformed surfaces adjacent to formed surfaces, strike off smooth and finish with a color and texture matching adjacent formed surfaces.
2. Continue final surface treatment of formed surfaces uniformly across adjacent unformed surfaces unless otherwise indicated.

3.08 FINISHING FLOORS AND SLABS

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

B. Trowel Finish:

1. After applying float finish, apply first troweling and consolidate concrete by hand or power-driven trowel.
2. Continue troweling passes and restraighten until surface is free of trowel marks and uniform in texture and appearance.
3. Grind smooth any surface defects that would telegraph through applied coatings or floor coverings.
4. Do not add water to concrete surface.
5. Do not apply hard-troweled finish to concrete, which has a total air content greater than 3 percent.

6. Apply a trowel finish to 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.

C. Broom Finish: Apply a broom finish to exterior concrete platforms, steps, ramps, and locations indicated on Drawings.

1. Immediately after float finishing, slightly roughen trafficked surface by brooming with fiber-bristle broom perpendicular to main traffic route.
2. Coordinate required final finish with Architect before application.

3.09 FINISH FLOOR TOLERANCES

A. Finish floor tolerances shall meet the following:

1. Trowel finish surfaces to the following tolerances, in accordance with ASTM E1155, for a randomly trafficked floor surface:
   a. Slabs on Ground:
      1) Comply with flatness and levelness tolerances for trowel-finished floor surfaces.

3.010 INSTALLATION OF MISCELLANEOUS CONCRETE ITEMS

A. Filling In:

1. Fill in holes and openings left in concrete structures after Work of other trades is in place unless otherwise indicated.
2. Mix, place, and cure concrete, as specified, to blend with in-place construction.
3. Provide other miscellaneous concrete filling indicated or required to complete the Work.

B. Curbs: Provide monolithic finish to interior curbs by stripping forms while concrete is still green and by steel-troweling surfaces to a hard, dense finish with corners, intersections, and terminations slightly rounded.

C. Equipment Bases and Foundations:

1. Coordinate sizes and locations of concrete bases with actual equipment provided.
2. Construct concrete bases 6 inches high unless otherwise indicated on Drawings, and extend base not less than 6 inches in each direction beyond the maximum dimensions of supported equipment unless otherwise indicated on Drawings, or unless required for seismic anchor support.
3. Minimum Compressive Strength: 4000 psi at 28 days.
4. Install dowel rods to connect concrete base to concrete floor. Unless otherwise indicated, install dowel rods on 18-inch centers around the full perimeter of concrete base. Drill and epoxy into concrete base with approved concrete epoxy material.
5. For supported equipment, install approved anchor bolts that extend through concrete base and anchor into structural concrete substrate.
6. Prior to pouring concrete, place and secure anchorage devices.
   a. Verify with Structural Engineer of Record the location, size and thickness of equipment base/
   b. Use setting drawings, templates, diagrams, instructions, and directions furnished with items to be embedded.
   c. Cast anchor-bolt insert into bases.
   d. Install anchor bolts to elevations required for proper attachment to supported equipment.

3.011 CONCRETE CURING

A. Protect freshly placed concrete from premature drying and excessive cold or hot temperatures.

1. Comply with ACI 301 and ACI 306.1 for cold weather protection during curing.
2. Comply with ACI 301 and ACI 305.1 for hot-weather protection during curing.
3. Maintain moisture loss no more than 0.2 lb/sq. ft. x h before and during finishing operations.

B. Cold-Weather Placement: Comply with ACI 306.1, ACI 306R 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 the average of the highest and lowest ambient temperature from midnight to midnight is expected to be less than 40 degrees F for more than three successive days, deliver concrete to meet the following minimum temperatures immediately after placement:
   a. 55 degrees F for sections less than 12 inches in the least dimension;
   b. 50 degrees F for sections 12 to 36 inches in the least dimension;
   c. 45 degrees F for sections 36 to 72 inches in the least dimension; and
   d. 40 degrees F for sections greater than 72 inches in the least dimension.
2. The temperature of concrete as placed shall not exceed these values by more than 20 degrees F. If exceeded, concrete shall not be placed and engineer of record shall be notified.
3. The minimum requirements may be terminated when temperatures above 50 degrees F occur during more than half of any 24 hour duration.
4. When the outdoor temperature is less than 40 degrees F, maintain temperature of placed concrete at not less than 50 degrees F for required curing time.
5. Do not use frozen materials or materials containing ice or snow. Do not place concrete on frozen subgrade or on subgrade containing frozen materials.
6. Do not use calcium chloride, salt, or other materials containing antifreeze agents or chemical accelerators unless otherwise specified and approved in mixture designs.

C. Hot-Weather Placement: Comply with ACI 301, ACI 305.1, ACI 305R, and as follows:

1. Maintain concrete temperature below 90 deg F at time of placement. If exceeded, concrete shall not be placed and engineer of record shall be notified. 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. Fog-spray forms, steel reinforcement, and subgrade just before placing concrete. Keep subgrade uniformly moist without standing water, soft spots, or dry areas.
3. Precautions to protect fresh concrete from developing plastic shrinkage cracks must be taken in advance of concrete placement when evaporation rate due to any combination of temperature, humidity, and wind velocity is expected to approach 0.2 lb./sq. ft./hr. as determined by ACI 305R. Acceptable precautions to reduce the rate of evaporation include use of wind breaks, fog spray, covering with polyethylene sheeting, or wet cover.

D. Windy Weather Placement: Comply with ACI 301, ACI 305.1, ACI 305R and as follows:

E. Precautions to protect fresh concrete from developing plastic shrinkage cracks must be taken in advance of concrete placement when evaporation rate due to any combination of temperature, humidity, and wind velocity is expected to approach 0.2 lb./sq. ft./hr. as determined by ACI 305R. Acceptable precautions to reduce the rate of evaporation include use of wind breaks, fog spray, covering with polyethylene sheeting, or wet cover.

F. Curing Formed Surfaces: Comply with ACI 308.1 as follows:

1. Cure formed concrete surfaces, including underside of beams, supported slabs, and other similar surfaces.
2. Cure concrete containing color pigments in accordance with color pigment manufacturer's instructions.
3. If forms remain during curing period, moist cure after loosening forms.
4. If removing forms before end of curing period, continue curing for remainder of curing period with one of the following:
   a. Continuous Fogging: Maintain standing water on concrete surface until final setting of concrete.
   b. Continuous Sprinkling: Maintain concrete surface continuously wet.
   c. Absorptive Cover: Pre-dampen absorptive material before application; apply additional water to absorptive material to maintain concrete surface continuously wet.
   d. Water-Retention Sheeting Materials: Cover exposed concrete surfaces with sheeting material, taping, or lapping seams.
   e. Membrane-Forming Curing Compound: Apply uniformly in continuous operation by power spray or roller in accordance with manufacturer's written instructions.
      1) Recoat areas subject to heavy rainfall within three hours after initial application.
      2) Maintain continuity of coating and repair damage during curing period.

G. Curing Unformed Surfaces: Comply with ACI 308.1 as follows:

1. Begin curing immediately after finishing concrete.
2. Interior Concrete Floors:
   a. Floors to Receive Floor Coverings Specified in Other Sections: Contractor has option of the following:
      1) Absorptive Cover: As soon as concrete has sufficient set to permit application without marring concrete surface, install prewetted absorptive cover over entire area of floor.
         a) Lap edges and ends of absorptive cover not less than 12-inches.
         b) Maintain absorptive cover water saturated, and in place, for duration of curing period, but not less than seven days.
      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, and sealed by waterproof tape or adhesive.
         a) Immediately repair any holes or tears during curing period, using cover material and waterproof tape.
         b) Cure for not less than seven days.
   b. Floors to Receive Curing Compound:
      1) Apply uniformly in continuous operation by power spray or roller in accordance with manufacturer's written instructions.
      2) Recoat areas subjected to heavy rainfall within three hours after initial application.
      3) Maintain continuity of coating, and repair damage during curing period.
      4) Removal: After curing period has elapsed, remove curing compound without damaging concrete surfaces by method recommended by curing compound

manufacturer unless manufacturer certifies curing compound does not interfere with bonding of floor covering used on Project.

c. Floors to Receive Curing and Sealing Compound:

1) Apply uniformly to floors and slabs indicated in a continuous operation by power spray or roller in accordance with manufacturer's written instructions.

2) Recoat areas subjected to heavy rainfall within three hours after initial application.

3) Repeat process 24 hours later, and apply a second coat. Maintain continuity of coating, and repair damage during curing period.

3.012 TOLERANCES

A. Conform to ACI 117.

3.013 APPLICATION OF LIQUID FLOOR TREATMENTS

A. Penetrating Liquid Floor Treatment: Prepare, apply, and finish penetrating liquid floor treatment in accordance with manufacturer's written instructions.

1. Remove curing compounds, sealers, oil, dirt, laitance, and other contaminants and complete surface repairs.
2. Do not apply to concrete that is less than seven days old.
3. Apply liquid until surface is saturated, scrubbing into surface until a gel forms; rewet; and repeat brooming or scrubbing.
4. Rinse with water; remove excess material until surface is dry.
5. Apply a second coat in a similar manner if surface is rough or porous.

B. Sealing Coat: Uniformly apply a continuous sealing coat of curing and sealing compound to hardened concrete by power spray or roller in accordance with manufacturer's written instructions.

3.014 JOINT FILLING

A. Prepare, clean, and install joint filler in accordance with manufacturer's written instructions.

1. Defer joint filling until concrete has aged at least one month(s).
2. 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 joints clean and dry.

C. Install semirigid joint filler full depth in saw-cut joints and at least 2 inches deep in formed joints.

D. Overfill joint, and trim joint filler flush with top of joint after hardening.

3.015 CONCRETE SURFACE REPAIRS

A. Defective Concrete:

1. Repair and patch defective areas when approved by Architect or Structural Engineer of Record.
2. Remove and replace concrete that cannot be repaired and patched to Architect's or Structural Engineer of Record’s approval.

B. Patching Mortar: Mix dry-pack patching mortar, consisting of 1 part portland cement to 2-1/2 parts fine aggregate passing a No. 16 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 in any dimension to solid concrete.
    a. Limit cut depth to 3/4 inch.
    b. Make edges of cuts perpendicular to concrete surface.
    c. Clean, dampen with water, and brush-coat holes and voids with bonding agent.
    d. Fill and compact with patching mortar before bonding agent has dried.
    e. 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 matches surrounding color.
    a. Patch a test area at inconspicuous locations to verify mixture and color match before proceeding with patching.
    b. Compact mortar in place and strike off slightly higher than surrounding surface.
3. Repair defects on concealed formed surfaces that will affect concrete's durability and structural performance as determined by Architect.

D. Repairing Unformed Surfaces:
1. Test unformed surfaces, such as floors and slabs, for finish, and verify surface tolerances specified for each surface.
    a. Correct low and high areas.
    b. Test surfaces sloped to drain for trueness of slope and smoothness; use a sloped template.
2. Repair finished surfaces containing surface defects, including spalls, popouts, honeycombs, rock pockets, crazing, and cracks in excess of 0.01 inch wide or that penetrate to reinforcement or completely through unreinforced sections regardless of width, and other objectionable conditions.
3. After concrete has cured at least 14 days, correct high areas by grinding.
4. Correct localized low areas during, or immediately after, completing surface-finishing operations by cutting out low areas and replacing with patching mortar.
    a. Finish repaired areas to blend into adjacent concrete.
5. Correct other low areas scheduled to receive floor coverings with a repair underlayment.
    a. Prepare, mix, and apply repair underlayment and primer in accordance with manufacturer's written instructions to produce a smooth, uniform, plane, and level surface.
    b. Feather edges to match adjacent floor elevations.
6. Correct other low areas scheduled to remain exposed with repair topping.
    a. Cut out low areas to ensure a minimum repair topping depth of 1/4 inch to match adjacent floor elevations.
    b. Prepare, mix, and apply repair topping and primer in accordance with manufacturer's written instructions to produce a smooth, uniform, plane, and level surface.
7. Repair defective areas, except random cracks and single holes 1 inch or less in diameter, by cutting out and replacing with fresh concrete.
    a. Remove defective areas with clean, square cuts, and expose steel reinforcement with at least a 3/4-inch clearance all around.

b. Dampen concrete surfaces in contact with patching concrete and apply bonding agent.

c. Mix patching concrete of same materials and mixture as original concrete, except without coarse aggregate.

d. Place, compact, and finish to blend with adjacent finished concrete.

e. Cure in same manner as adjacent concrete.

8. Repair random cracks and single holes 1 inch or less in diameter with patching mortar.

a. Groove top of cracks and cut out holes to sound concrete, and clean off dust, dirt, and loose particles.

b. Dampen cleaned concrete surfaces and apply bonding agent.

c. Place patching mortar before bonding agent has dried.

d. Compact patching mortar and finish to match adjacent concrete.

e. Keep patched area continuously moist for at least 72 hours.

E. Perform structural repairs of concrete, subject to Architect or Structural Engineer of Record’s approval, using epoxy adhesive and patching mortar.

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

3.016 FIELD QUALITY CONTROL

A. Special Inspections: Owner will engage a special inspector to perform field tests and inspections and prepare testing and inspection reports.

B. Testing Agency: Owner will engage a qualified testing and inspecting agency to perform tests and inspections and to submit reports.

1. Testing agency shall be responsible for providing curing container for composite samples on Site and verifying that field-cured composite samples are cured in accordance with ASTM C31/C31M.

2. Testing agency shall immediately report to Architect, Contractor, and concrete manufacturer any failure of Work to comply with Contract Documents.

3. Testing agency shall report results of tests and inspections, in writing, to Owner, Architect, Contractor, and concrete manufacturer within 48 hours of inspections and tests.

a. Test reports shall include reporting requirements of ASTM C31/C31M, ASTM C39/C39M, and ACI 301, including the following as applicable to each test and inspection:

1) Project name.

2) Name of testing agency.

3) Names and certification numbers of field and laboratory technicians performing inspections and testing.

4) Name of concrete manufacturer.

5) Date and time of inspection, sampling, and field testing.

6) Date and time of concrete placement.

7) Location in Work of concrete represented by samples.

8) Date and time sample was obtained.

9) Truck and batch ticket numbers.

10) Design compressive strength at 28 days.

11) Concrete mixture designation, proportions, and materials.

12) Field test results.

13) Information on storage and curing of samples before testing, including curing method and maximum and minimum temperatures during initial curing period.

14) Type of fracture and compressive break strengths at seven days and 28 days.

C. Batch Tickets: For each load delivered, submit three copies of batch delivery ticket to testing agency, indicating quantity, mix identification, admixtures, design strength, aggregate size, design air content, design slump at time of batching, and amount of water that can be added at Project site.

D. Inspections:

1. Verification of use of required design mixture.
2. Concrete placement, including conveying and depositing.
3. Curing procedures and maintenance of curing temperature.
4. Verification of concrete strength before removal of shores and forms from beams and slabs.
5. Batch Plant Inspections: On a random basis, as determined by Architect.
6. All other special inspection items as noted on the Contract Drawings.

E. Concrete Tests: Testing of composite samples of fresh concrete obtained in accordance with ASTM C 172/C 172M shall be performed in accordance with the following requirements:

1. Testing Frequency: Obtain one composite sample for each day's pour of each concrete mixture exceeding 5 cu. yd., but less than 25 cu. yd., plus one set for each additional 50 cu. yd. or fraction thereof. For slabs, obtain at least one composite sample for the minimum of each slab pour
   a. One Composite sample shall consist of a minimum of four cylinders.
   b. When frequency of testing provides fewer than five compressive-strength tests for each concrete mixture, testing shall be conducted from at least five randomly selected batches or from each batch if fewer than five are used.
2. Slump: ASTM C143/C143M:
   a. One test at point of placement for each composite sample, but not less than one test for each day's pour of each concrete mixture.
   b. Perform additional tests when concrete consistency appears to change.
3. Slump Flow: ASTM C1611/C1611M:
   a. One test at point of placement for each composite sample, but not less than one test for each day's pour of each concrete mixture.
   b. Perform additional tests when concrete consistency appears to change.
4. Air Content: ASTM C231/C231M pressure method, for normal-weight concrete;
   a. One test for each composite sample, but not less than one test for each day's pour of each concrete mixture.
5. Concrete Temperature: ASTM C1064/C1064M:
   a. One test hourly when air temperature is 40 deg F and below or 80 deg F and above, and one test for each composite sample.
6. Unit Weight: ASTM C567/C567M fresh unit weight of structural lightweight concrete.
   a. One test for each composite sample, but not less than one test for each day's pour of each concrete mixture.

7. Compression Test Specimens: ASTM C31/C31M:
    a. Cast and laboratory cure two sets of four 6-inch by 12-inch or 4-inch by 8-inch cylinder specimens for each composite sample.
    b. Cast, initial cure, and field cure two sets of two standard cylinder specimens for each composite sample.
8. Compressive-Strength Tests: ASTM C39/C39M.
    a. Test one set of two laboratory-cured specimens at seven days and one set of two specimens at 28 days.
    b. Test one set of two field-cured specimens at seven days and one set of two specimens at 28 days.
    c. A compressive-strength test shall be the average compressive strength from a set of two specimens obtained from same composite sample and tested at age indicated.
9. 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.
10. Strength of each concrete mixture 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 if specified compressive strength is 5000 psi, or no compressive strength test value is less than 10 percent of specified compressive strength if specified compressive strength is greater than 5000 psi.
11. 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.
12. Additional Tests:
    a. 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.
    b. Testing and inspecting agency may conduct tests to determine adequacy of concrete by cored cylinders complying with ASTM C42/C42M or by other methods as directed by Architect.
        1) Acceptance criteria for concrete strength shall be in accordance with ACI 301 section 1.6.6.3.
13. Additional testing and inspecting, at Contractor's expense, will be performed to determine compliance of replaced or additional work with specified requirements.
14. Correct deficiencies in the Work that test reports and inspections indicate do not comply with the Contract Documents.
15. Inspection Reports shall include items inspected, inspection locations and verification of compliance or deviations from the Contract Documents.
16. Concrete strength tests made and tested by testing laboratory shall be the sole criteria of concrete strength unless in-situ tests are made in accordance with the Building Code by a qualified independent testing laboratory. Concrete for which strength tests do not meet criteria for acceptance shall be considered inadequate until proven otherwise.
17. Where concrete strength tests fail to meet the criteria specified herein, the Structural Engineer of Record shall be the sole judge of structural adequacy of concrete.
    a. The burden of proof of structural adequacy shall be the responsibility of the Contractor.

b. If upon the evaluation of structural adequacy the testing is inadequate strength, in opinion of the Structural Engineer of Record, portions of the structure shall be repaired or removed and replaced as directed by the Structural Engineer of Record at no additional expense to the owner.

18. If strength tests fall below the specified strength, Contractor shall either improve curing conditions or shall modify the design mixtures to improve strength.

F. Measure floor and slab flatness and levelness in accordance with ASTM E1155 within 48 hours of completion of floor finishing and promptly report test results to Architect.

3.017 PROTECTION

A. Protect concrete surfaces as follows:

1. Protect from petroleum stains.
2. Diaper hydraulic equipment used over concrete surfaces.
3. Prohibit vehicles from interior concrete slabs.
4. Prohibit use of pipe-cutting machinery over concrete surfaces.
5. Prohibit placement of steel items on concrete surfaces.
6. Prohibit use of acids or acidic detergents over concrete surfaces.
7. Protect liquid floor treatment from damage and wear during the remainder of construction period. Use protective methods and materials, including temporary covering, recommended in writing by liquid floor treatments installer.
8. Protect concrete surfaces scheduled to receive surface hardener or polished concrete finish using Floor Slab Protective Covering.

END OF SECTION 03 3000

SECTION 06 1053
MISCELLANEOUS ROUGH CARPENTRY

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Preservative treated wood materials.

B. Fire retardant treated wood materials.

C. Miscellaneous wood nailers, furring, and grounds.

1.02 REFERENCE STANDARDS

A. ASTM A153/A153M - Standard Specification for Zinc Coating (Hot-Dip) on Iron and Steel Hardware 2016a.

B. AWPA U1 - Use Category System: User Specification for Treated Wood 2022.

C. PS 20 - American Softwood Lumber Standard 2021.

1.03 SUBMITTALS

A. See Section 01 3000 - Administrative Requirements for submittal procedures.

B. Product Data: Provide technical data on wood preservative materials and application instructions.

1.04 DELIVERY, STORAGE, AND HANDLING

A. General: Cover wood products to protect against moisture. Support stacked products to prevent deformation and to allow air circulation.

PART 2 PRODUCTS

2.01 GENERAL REQUIREMENTS

A. Dimension Lumber: Comply with PS 20 and requirements of specified grading agencies.
   1. If no species is specified, provide species graded by the agency specified; if no grading agency is specified, provide lumber graded by grading agency meeting the specified requirements.
   2. Grading Agency: Grading agency whose rules are approved by the Board of Review, American Lumber Standard Committee (www.alsc.org) and who provides grading service for the species and grade specified; provide lumber stamped with grade mark unless otherwise indicated.
   3. Lumber of other species or grades is acceptable provided structural and appearance characteristics are equivalent to or better than products specified.

2.02 ACCESSORIES

A. Fasteners and Anchors:
   1. Metal and Finish: Hot-dipped galvanized steel complying with ASTM A153/A153M for high humidity and preservative-treated wood locations, unfinished steel elsewhere.

2.03 FACTORY WOOD TREATMENT

A. Treated Lumber and Plywood: Comply with requirements of AWPA U1 - Use Category System for wood treatments determined by use categories, expected service conditions, and specific applications.
   1. Fire-Retardant Treated Wood: Mark each piece of wood with producer's stamp indicating compliance with specified requirements.
   2. Preservative-Treated Wood: Provide lumber and plywood marked or stamped by an ALSC-accredited testing agency, certifying level and type of treatment in accordance with AWPA standards.

B. Preservative Treatment:
   1. Preservative Pressure Treatment of Lumber Above Grade: AWPA U1, Use Category UC3B, Commodity Specification A using waterborne preservative to 0.10 lb/cu ft retention.
      a. Kiln dry lumber after treatment to maximum moisture content of 19 percent.

PART 3 EXECUTION

3.01 PREPARATION

A. Coordinate installation of rough carpentry members specified in other sections.

3.02 INSTALLATION - GENERAL

A. Select material sizes to minimize waste.

B. Reuse scrap to the greatest extent possible; clearly separate scrap for use on site as accessory components, including: shims, bracing, and blocking.

C. Where treated wood is used on interior, provide temporary ventilation during and immediately after installation sufficient to remove indoor air contaminants.

3.03 BLOCKING, NAILERS, AND SUPPORTS

A. Provide framing and blocking members as indicated or as required to support finishes, fixtures, specialty items, and trim.

3.04 SITE APPLIED WOOD TREATMENT

A. Apply preservative treatment compatible with factory applied treatment at site-sawn cuts, complying with manufacturer's instructions.

B. Allow preservative to dry prior to erecting members.

3.05 CLEANING

A. Waste Disposal: See Section 01 7419 - Construction Waste Management and Disposal.
   1. Comply with applicable regulations.
   2. Do not burn scrap on project site.
   3. Do not burn scraps that have been pressure treated.
   4. Do not send materials treated with pentachlorophenol, CCA, or ACA to co-generation facilities or “waste-to-energy” facilities.

B. Do not leave wood, shavings, sawdust, etc. on the ground or buried in fill.

C. Prevent sawdust and wood shavings from entering the storm drainage system.

END OF SECTION

SECTION 06 2000
FINISH CARPENTRY

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Wood door frames, glazed frames.

B. Miscellaneuous carpentry reuired for the installation of new window units.

C. Installation of door hardware.

1.02 RELATED REQUIREMENTS

A. Section 06 1000 - Rough Carpentry: Support framing, grounds, and concealed blocking.

B. Section 08 1433 - Stile and Rail Wood Doors.

1.03 REFERENCE STANDARDS

A. AWI/AWMAC/WI (AWS) - Architectural Woodwork Standards, 2nd Edition 2014, with Errata (2016).

B. AWMAC/WI (NAAWS) - North American Architectural Woodwork Standards 2021, with Errata.

1.04 DELIVERY, STORAGE, AND HANDLING

A. Store finish carpentry items under cover, elevated above grade, and in a dry, well-ventilated area not exposed to heat or sunlight.

B. Protect from moisture damage.

C. Handle materials and products to prevent damage to edges, ends, or surfaces.

PART 2 PRODUCTS

2.01 FINISH CARPENTRY ITEMS

A. Quality Standard: Custom Grade, in accordance with AWI/AWMAC/WI (AWS) or AWMAC/WI (NAAWS), unless noted otherwise.

B. Surface Burning Characteristics: Provide materials having fire and smoke properties as required by applicable code.

C. Exterior Woodwork Items:
   1. Window Casings, Filler Panels and Moldings: Hardwood; prepare for paint finish.

D. Interior Woodwork Items:
   1. Miscellaneuous associated wood window Sills, casings, stools and aprins related to the installation of new windows. Prepare for finish to match existing.

2.02 LUMBER MATERIALS

A. Hardwood Lumber: oak species, quarter sawn, maximum moisture content of 6 percent ; with vertical grain , of quality suitable for transparent finish.

2.03 ACCESSORIES

A. Adhesive: Type recommended by fabricator to suit application.

B. Lumber for Shimming and Blocking: Softwood lumber of [_____] species.

C. Primer: 09 9113 - Exterior Painting.

D. Wood Filler: Solvent base, tinted to match surface finish color.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify adequacy of backing and support framing.

3.02 INSTALLATION

A. Install factory-fabricated units in accordance with manufacturer's printed installation instructions.

B. Set and secure materials and components in place, plumb and level.

C. Carefully scribe work abutting other components, with maximum gaps of 1/32 inch. Do not use additional overlay trim to conceal larger gaps.

3.03 SITE APPLIED WOOD TREATMENT (EXTERIOR INSTALLATIONS)

A. Apply preservative treatment in accordance with manufacturer's instructions.

B. Brush apply one coats of preservative treatment on wood in contact with cementitious materials. Treat site-sawn cuts.

C. Allow preservative to dry prior to erecting members.

3.04 PREPARATION FOR SITE FINISHING

A. Set exposed fasteners. Apply wood filler in exposed fastener indentations. Sand work smooth.

END OF SECTION

SECTION 07 1716
BENTONITE COMPOSITE SHEET WATERPROOFING

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Bentonite clay composite sheet waterproofing and accessories.

1.02 RELATED REQUIREMENTS

A. Section 31 2323 - Fill.

B. Section 33 4100 - Subdrainage.

1.03 REFERENCE STANDARDS

A. ASTM D5993 - Standard Test Method for Measuring Mass per Unit Area of Geosynthetic Clay Liners 2018.

B. NRCA (WM) - The NRCA Waterproofing Manual 2021.

1.04 SUBMITTALS

A. See Section 01 3000 - Administrative Requirements for submittal procedures.

B. Product Data: Provide product criteria, characteristics, accessories, jointing and seaming methods, and termination conditions.

C. Shop Drawings: Indicate required flashings, control joints, and expansion joints, sealing at openings, projections, penetrations, reglets, and sleeves.

D. Certificate: Certify that products meet or exceed specified requirements.

E. Manufacturer's Installation Instructions: Indicate special preparation of substrate, panel attachment methods, and perimeter conditions requiring special attention.

F. Warranty: Submit manufacturer warranty and ensure forms have been completed in Owner's name and registered with manufacturer.

1.05 QUALITY ASSURANCE

A. Installer Qualifications: Company specializing in performing work of the type specified and with at least three years of documented experience.

1.06 DELIVERY, STORAGE, AND HANDLING

A. Deliver materials in manufacturer's original containers, dry and undamaged, with seals and labels intact.

B. Store and handle materials in accordance with manufacturer's written instructions.

C. Maintain minimum ambient storage temperatures of 40 degrees F for bentonite composite sheet products.

1.07 FIELD CONDITIONS

A. Maintain ambient temperatures above 40 degrees F for at least 24 hours before and during application.

1.08 WARRANTY

A. See Section 01 7800 - Closeout Submittals for additional warranty requirements.

B. Manufacturer Warranty: Provide 2-year manufacturer warranty for waterproofing failing to resist penetration of water, except where such failures are resulting from structural failures of building; hairline cracking of concrete due to temperature change or shrinkage is not considered a structural failure. Complete forms in Owner's name and register with manufacturer.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. Bentonite Composite Sheet Waterproofing:

1. AVM Industries, Inc; Aussie Clay 590: www.avmindustries.com/#sle.

2. Carlisle Coatings and Waterproofing, Inc; CCW MiraCLAY: www.carlisleccw.com/#sle.
3. CETCO, a division of Minerals Technologies Inc; SWELLTITE: www.mineralstech.com/#sle.
4. EPRO Services, Inc; Bento-Pro Plus: www.eproinc.com/#sle.
5. Mar-flex Waterproofing & Building Products: www.mar-flex.com/#sle.
6. TegraSeal Product, LLC: www.tegraseal.com/#sle.
7. Tremco Commercial Sealants and Waterproofing: www.tremcosealants.com/#sle.
8. Substitutions: See Section 01 6000 - Product Requirements.

2.02 MATERIALS

A. Bentonite: Pure bentonite clay, granulated, dry, and comprised of at least 50 percent sodium montmorillonite; with at least 90 percent passing No.20 mesh sieve, and maximum of 10 percent passing No.200 mesh sieve.

B. Three-Ply, Geotextile-Faced Composite Sheets: One layer of non-woven polypropylene geotextile fabric laminated to center core filled with self-healing, self-expanding bentonite clay granules and one layer of high density polyethylene film laminated to outside of bentonite.
   1. Sheet Width: 40 inches, nominal.
   2. Bentonite Fill: 1.0 lb/sq ft, minimum, in accordance with ASTM D5993.

C. Joint Packing: Biodegradable kraft paper containers filled with bentonite clay granules; 1-1/4 inches square or 2-3/8 inches triangular by 24 inches long.

D. Joint Seal: Moist and hydrated bentonite clay gel using water and glycol for below-freezing application and water for above-freezing application.

2.03 ACCESSORIES

A. Fasteners: Galvanized, washerhead concrete or masonry screws.

B. Adhesive: Manufacturer's recommended type.

C. Polyethylene Sheet: 3 mil, 0.003 inch thick.

D. Drainage Panel: Formed plastic, 1/4 inch thick, and hollowed sandwich.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify existing conditions before starting this work.

B. Verify substrate surfaces are smooth, durable, and free of matter detrimental to application of waterproofing system.

C. Verify items that penetrate surfaces to receive waterproofing are securely installed.

3.02 PREPARATION

A. Clean and prepare surfaces to receive waterproofing in accordance with manufacturer's installation instructions.

B. Fill holes, cracks, honeycombs, and voids with joint sealant at least 1/8 inch thick, and extend at least 3 inches beyond defect.

3.03 INSTALLATION

A. Install panels in accordance with manufacturer's installation instructions and applicable requirements of NRCA (WM).

B. Cut composite sheets parallel to corrugations to prevent loss of bentonite.

C. Seal construction joints, control joints, through-wall projections and penetrations, and cold joints in concrete foundation with joint sealant and packing mastic.

D. Vertical Surfaces:
   1. Install composite sheets with masonry screws, starting at base of foundation.
   2. Fold sheets around corners with corrugations vertical, and install unfolded sheets with corrugations horizontal.
   3. Lap adjoining sheets 1-1/2 inches.
   4. Stagger vertical joints at mid-sheet on succeeding courses.

5. Install one extra layer of sheets at external corners.
6. Place joint packing continuously along junction of wall and footing and at termination of sheets; secure properly to prevent movement.

E. Drainage Panel:
1. Install drainage panel directly over waterproofing, butt joints, and position to ensure downward drainage.
2. Scribe and cut drainage panels around projections, penetrations, and interruptions.
3. Adhere drainage panel to substrate with mastic.

3.04 PROTECTION

A. Do not permit traffic over unprotected or uncovered waterproofing.

B. Cover installed composite sheet waterproofing with temporary polyethylene sheeting; remove sheeting just before backfilling begins.

END OF SECTION

SECTION 07 9200
JOINT SEALANTS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Nonsag gunnable joint sealants.

B. Joint backings and accessories.

1.02 REFERENCE STANDARDS

A. ASTM C661 - Standard Test Method for Indentation Hardness of Elastomeric-Type Sealants by Means of a Durometer 2015 (Reapproved 2022).

B. ASTM C920 - Standard Specification for Elastomeric Joint Sealants 2018.

C. ASTM C1193 - Standard Guide for Use of Joint Sealants 2016.

D. ASTM C1248 - Standard Test Method for Staining of Porous Substrate by Joint Sealants 2022.

1.03 SUBMITTALS

A. See Section 01 3000 - Administrative Requirements for submittal procedures.

B. Product Data: Submit manufacturer's technical datasheets for each product to be used; include the following:
   1. Physical characteristics, including movement capability, VOC content, hardness, cure time, and color availability.
   2. List of backing materials approved for use with the specific product.
   3. Substrates that product is known to satisfactorily adhere to and with which it is compatible.
   4. Substrates the product should not be used on.
   5. Substrates for which use of primer is required.
   6. Installation instructions, including precautions, limitations, and recommended backing materials and tools.

C. Product Data for Accessory Products: Submit manufacturer's technical data sheet for each product to be used, including physical characteristics, installation instructions, and recommended tools.

D. Color Cards for Selection: Where sealant color is not specified, submit manufacturer's color cards showing standard colors available for selection.

E. Executed warranty.

1.04 WARRANTY

A. See Section 01 7800 - Closeout Submittals for additional warranty requirements.

B. Manufacturer Warranty: Provide 2-year manufacturer warranty for installed sealants and accessories that fail to achieve a watertight seal, exhibit loss of adhesion or cohesion, or do not cure. Complete forms in Owner's name and register with manufacturer.

PART 2 PRODUCTS

2.01 JOINT SEALANT APPLICATIONS

A. Scope:
   1. Exterior Joints: Seal open joints, whether or not the joint is indicated on drawings, unless specifically indicated not to be sealed. Exterior joints to be sealed include, but are not limited to:
      a. Joints between door, window, and other frames and adjacent construction.

2.02 JOINT SEALANTS - GENERAL

2.03 NONSAG JOINT SEALANTS

A. Nonstaining Silicone Sealant: ASTM C920, Grade NS, Uses M and A; not expected to withstand continuous water immersion or traffic.
   1. Movement Capability: Plus and minus 50 percent, minimum.

2. Nonstaining to Porous Stone: Nonstaining to light-colored natural stone when tested in accordance with ASTM C1248.
3. Dirt Pick-Up: Reduced dirt pick-up compared to other silicone sealants.
4. Hardness Range: 15 to 35, Shore A, when tested in accordance with ASTM C661.
5. Color: To be selected by Architect from manufacturer's standard range.
6. Service Temperature Range: Minus 20 to 180 degrees F.
7. Products:
    a. Dow: www.dow.com/#sle.
    b. Pecora Corporation: www.pecora.com/#sle.
    c. Sika Corporation: www.usa.sika.com/#sle.
    d. Tremco Commercial Sealants & Waterproofing: www.tremcosealants.com/#sle.
    e. Substitutions: See Section 01 6000 - Product Requirements.

B. Polyurethane Sealant: ASTM C920, Grade NS, Uses M and A; single or multi-component; not expected to withstand continuous water immersion or traffic.
1. Movement Capability: Plus and minus 50 percent, minimum.
2. Hardness Range: 20 to 35, Shore A, when tested in accordance with ASTM C661.
3. Color: To be selected by Architect from manufacturer's standard range.
4. Service Temperature Range: Minus 40 to 180 degrees F.
5. Products:
    a. Pecora Corporation: www.pecora.com/#sle.
    b. Sika Corporation: www.usa.sika.com/#sle.
    c. Tremco Commercial Sealants & Waterproofing: www.tremcosealants.com/#sle.
    d. W. R. Meadows, Inc: www.wrmeadows.com/#sle.
    e. Substitutions: See Section 01 6000 - Product Requirements.

2.04 ACCESSORIES

A. Backer Rod: Cylindrical cellular foam rod with surface that sealant will not adhere to, compatible with specific sealant used, and recommended by backing and sealant manufacturers for specific application.
1. Closed Cell and Bi-Cellular: 25 to 33 percent larger in diameter than joint width.

B. Backing Tape: Self-adhesive polyethylene tape with surface that sealant will not adhere to and recommended by tape and sealant manufacturers for specific application.

C. Masking Tape: Self-adhesive, nonabsorbent, nonstaining, removable without adhesive residue, and compatible with surfaces adjacent to joints and sealants.

D. Joint Cleaner: Noncorrosive and nonstaining type, type recommended by sealant manufacturer; compatible with joint forming materials.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify that joints are ready to receive work.

B. Verify that backing materials are compatible with sealants.

C. Verify that backer rods are of the correct size.

3.02 PREPARATION

A. Remove loose materials and foreign matter that could impair adhesion of sealant.

B. Clean joints, and prime as necessary, in accordance with manufacturer's instructions.

C. Perform preparation in accordance with manufacturer's instructions and ASTM C1193.

D. Mask elements and surfaces adjacent to joints from damage and disfigurement due to sealant work; be aware that sealant drips and smears may not be completely removable.

3.03 INSTALLATION

A. Install this work in accordance with sealant manufacturer's requirements for preparation of surfaces and material installation instructions.

B. Provide joint sealant installations complying with ASTM C1193.

C. Install bond breaker backing tape where backer rod cannot be used.

D. Install sealant free of air pockets, foreign embedded matter, ridges, and sags, and without getting sealant on adjacent surfaces.

E. Do not install sealant when ambient temperature is outside manufacturer's recommended temperature range, or will be outside that range during the entire curing period, unless manufacturer's approval is obtained and instructions are followed.

F. Nonsag Sealants: Tool surface concave, unless otherwise indicated; remove masking tape immediately after tooling sealant surface.

END OF SECTION

SECTION 08 1113
HOLLOW METAL DOORS AND FRAMES

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Non-fire-rated hollow metal doors and frames.

B. Thermally insulated hollow metal doors with frames.

1.02 RELATED REQUIREMENTS

A. Section 08 7100 - Door Hardware.

1.03 ABBREVIATIONS AND ACRONYMS

A. ANSI: American National Standards Institute.

B. HMMA: Hollow Metal Manufacturers Association.

C. NAAMM: National Association of Architectural Metal Manufacturers.

D. NFPA: National Fire Protection Association.

E. SDI: Steel Door Institute.

F. UL: Underwriters Laboratories.

1.04 REFERENCE STANDARDS

A. ADA Standards - 2010 ADA Standards for Accessible Design 2010.

B. ANSI/SDI A250.4 - Test Procedure and Acceptance Criteria for Physical Endurance for Steel Doors, Frames and Frame Anchors 2022.

C. ANSI/SDI A250.8 - Specifications for Standard Steel Doors and Frames (SDI-100) 2017.

D. ANSI/SDI A250.10 - Test Procedure and Acceptance Criteria for Prime Painted Steel Surfaces for Steel Doors and Frames 2020.

E. ASTM A653/A653M - Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process 2022.

F. ASTM A1008/A1008M - Standard Specification for Steel, Sheet, Cold-Rolled, Carbon, Structural, High-Strength Low-Alloy, High-Strength Low-Alloy with Improved Formability, Required Hardness, Solution Hardened, and Bake Hardenable 2021a.

G. ASTM A1011/A1011M - Standard Specification for Steel, Sheet and Strip, Hot-Rolled, Carbon, Structural, High-Strength Low-Alloy, High-Strength Low-Alloy with Improved Formability, and Ultra-High Strength 2018a.

H. ASTM C143/C143M - Standard Test Method for Slump of Hydraulic-Cement Concrete 2020.

I. ASTM C476 - Standard Specification for Grout for Masonry 2022.

J. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials 2022.

K. BHMA A156.115 - Hardware Preparation in Steel Doors and Steel Frames 2016.

L. ICC A117.1 - Accessible and Usable Buildings and Facilities 2017.

M. NAAMM HMMA 830 - Hardware Selection for Hollow Metal Doors and Frames 2002.

N. NAAMM HMMA 831 - Hardware Locations for Hollow Metal Doors and Frames 2011.

O. NAAMM HMMA 840 - Guide Specifications For Receipt, Storage and Installation of Hollow Metal Doors and Frames 2017.

1.05 SUBMITTALS

A. See Section 01 3000 - Administrative Requirements for submittal procedures.

B. Product Data: Materials and details of design and construction, hardware locations, reinforcement type and locations, anchorage and fastening methods, and finishes; and one copy of referenced standards/guidelines.

C. Shop Drawings: Details of each opening, showing elevations, glazing, frame profiles, and any indicated finish requirements.

D. Installation Instructions: Manufacturer's published instructions, including any special installation instructions relating to this project.

1.06 QUALITY ASSURANCE

A. Manufacturer Qualifications: Provide hollow metal doors and frames from SDI Certified manufacturer: https://steeldoor.org/sdi-certified/#sle.

B. Installer Qualifications: Company specializing in performing work of the type specified and with at least three years of documented experience.

C. Maintain at project site copies of reference standards relating to installation of products specified.

1.07 DELIVERY, STORAGE, AND HANDLING

A. Comply with NAAMM HMMA 840 or ANSI/SDI A250.8 (SDI-100) in accordance with specified requirements.

B. Protect with resilient packaging; avoid humidity build-up under coverings; prevent corrosion and adverse effects on factory applied painted finish.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. Hollow Metal Doors and Frames:
1. Ceco Door, an Assa Abloy Group company: www.assaabloydss.com/#sle.
2. Curries, an Assa Abloy Group company: www.assaabloydss.com/#sle.
3. Mesker, dormakaba Group; FDJ Series Drywall Frames: www.meskeropeningsgroup.com/#sle.
4. Republic Doors, an Allegion brand: www.republicdoor.com/#sle.
5. Steelcraft, an Allegion brand: www.allegion.com/#sle.
6. Substitutions: See Section 01 6000 - Product Requirements.

2.02 PERFORMANCE REQUIREMENTS

A. Requirements for Hollow Metal Doors and Frames:
1. Steel Sheet: Comply with one or more of the following requirements; galvannealed steel complying with ASTM A653/A653M, cold-rolled steel complying with ASTM A1008/A1008M, or hot-rolled pickled and oiled (HRPO) steel complying with ASTM A1011/A1011M, commercial steel (CS) Type B, for each.
2. Accessibility: Comply with ICC A117.1 and ADA Standards.
3. Exterior Door Top Closures: Flush end closure channel, with top and door faces aligned.
4. Door Edge Profile: Manufacturers standard for application indicated.
5. Typical Door Face Sheets: Flush.
6. Hardware Preparations, Selections and Locations: Comply with NAAMM HMMA 830 and NAAMM HMMA 831 or BHMA A156.115 and ANSI/SDI A250.8 (SDI-100) in accordance with specified requirements.
7. Zinc Coating for Typical Exterior Locations: Provide metal components zinc-coated galvanized by the hot-dip process in accordance with ASTM A653/A653M, with manufacturer's standard coating thickness, unless noted otherwise for specific hollow metal doors and frames.
    a. Based on SDI Standards: Provide at least A40/ZF120 (galvannealed) at all exterior locations, coating not required for typical interior door applications, and at least A60/ZF180 (galvannealed) for corrosive locations.

B. Combined Requirements: If a particular door and frame unit is indicated to comply with more than one type of requirement, comply with the specified requirements for each type; for instance, an exterior door that is also indicated as being sound-rated must comply with the requirements specified for exterior doors and for sound-rated doors; where two requirements conflict, comply with the most stringent.

2.03 HOLLOW METAL DOORS

A. Door Finish: Factory primed and field finished.

B. Exterior Doors: Thermally insulated.
   1. Based on SDI Standards: ANSI/SDI A250.8 (SDI-100).
      a. Level 3 - Extra Heavy-duty.
      b. Physical Performance Level C, 250,000 cycles; in accordance with ANSI/SDI A250.4.
      c. Model 1 - Full Flush.
      d. Door Face Metal Thickness: 18 gauge, 0.042 inch, minimum.
      e. Zinc Coating: A60/ZF180 galvanized coating; ASTM A653/A653M.
         1) Locations: All exterior doors and fiberglass doors.
   2. Door Core Material: Manufacturers standard core material/construction and in compliance with requirements.
      a. Foam Plastic Insulation: Manufacturer's standard board insulation with maximum flame spread index (FSI) of 75, and maximum smoke developed index (SDI) of 450 in accordance with ASTM E84, and completely enclosed within interior of door.
   3. Door Thickness: 1-3/4 inches, nominal.
   4. Weatherstripping: Refer to Section 08 7100.
   5. Door Finish: Factory primed and field finished.

2.04 HOLLOW METAL FRAMES

A. Comply with standards and/or custom guidelines as indicated for corresponding door in accordance with applicable door frame requirements.

B. Exterior Door Frames: Full profile/continuously welded type.
   1. Galvanizing: Components hot-dipped galvanized in accordance with ASTM A653/A653M, with A40/ZF120 coating.
   2. Frame Metal Thickness: 16 gauge, 0.053 inch, minimum.
   3. Frame Finish: Factory primed and field finished.
   4. Weatherstripping: Separate, see Section 08 7100.

C. Provide mortar guard boxes for hardware cut-outs in frames to be installed in masonry, concrete or specified to be grouted.

D. Frames in Masonry Walls: Size to suit masonry coursing with head member 4 inches high to fill opening without cutting masonry units.

2.05 FINISHES

A. Primer: Rust-inhibiting, complying with ANSI/SDI A250.10, door manufacturer's standard.

B. Bituminous Coating: Cold-applied asphalt mastic, compounded for 15 mil, 0.015 inch dry film thickness (DFT) per coat; provide inert-type noncorrosive compound free of asbestos fibers, sulfur components, and other deleterious impurities.

2.06 ACCESSORIES

A. Mechanical Fasteners for Concealed Metal-to-Metal Connections: Self-drilling, self-tapping, steel with electroplated zinc finish.

B. Grout for Frames: Mortar grout complying with ASTM C476 with maximum slump of 4 inches as measured in accordance with ASTM C143/C143M for hand troweling in place; plaster grout and thinner pumpable grout are prohibited.

C. Silencers: Resilient rubber, fitted into drilled hole; provide three on strike side of single door, three on center mullion of pairs, and two on head of pairs without center mullions.

D. Temporary Frame Spreaders: Provide for factory- or shop-assembled frames.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify existing conditions before starting work.

B. Verify that opening sizes and tolerances are acceptable.

C. Verify that finished walls are in plane to ensure proper door alignment.

3.02 PREPARATION

A. Coat inside of frames to be installed in masonry or to be grouted, with bituminous coating, prior to installation.

3.03 INSTALLATION

A. Install doors and frames in accordance with manufacturer's instructions and related requirements of specified door and frame standards or custom guidelines indicated.

B. Coordinate frame anchor placement with wall construction.

C. Grout frames in masonry construction, using hand trowel methods; brace frames so that pressure of grout before setting will not deform frames.

D. Install door hardware as specified in Section 08 7100.

3.04 TOLERANCES

A. Maximum Diagonal Distortion: 1/16 inch measured with straight edge, corner to corner.

3.05 ADJUSTING

A. Adjust for smooth and balanced door movement.

3.06 SCHEDULE

A. Refer to Door and Frame Schedule on the drawings.

END OF SECTION

SECTION 08 5200
WOOD WINDOWS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Factory-fabricated wood windows.

B. Glazing.

C. Operating hardware.

D. Insect screens.

E. Wood trim for exterior finishing.

1.02 RELATED REQUIREMENTS

A. Section 07 9200 - Joint Sealants: Sealing joints between frames and adjacent construction.

1.03 REFERENCE STANDARDS

A. AAMA/WDMA/CSA 101/I.S.2/A440 - North American Fenestration Standard/Specification for Windows, Doors, and Skylights 2017.

B. AAMA 2603 - Voluntary Specification, Performance Requirements and Test Procedures for Pigmented Organic Coatings on Aluminum Extrusions and Panels (with Coil Coating Appendix) 2022.

1.04 SUBMITTALS

A. See Section 01 3000 - Administrative Requirements for submittal procedures.

B. Product Data: Show component dimensions, anchorage and fasteners, glass, and internal drainage details.

C. Shop Drawings: Indicate opening dimensions, framed opening tolerances, affected related work, and installation requirements.

D. Specimen warranty.

1.05 QUALITY ASSURANCE

A. Manufacturer Qualifications: Company specializing in manufacturing products specified in this section with not less than three years of documented experience.

B. Installer Qualifications: Company specializing in performing work of the type specified and with at least three years of documented experience.

1.06 DELIVERY, STORAGE, AND HANDLING

A. Protect factory finished surfaces with wrapping. Do not use adhesive papers or sprayed coatings that bond when exposed to sunlight or weather.

1.07 FIELD CONDITIONS

A. Do not install sealants when ambient temperature is less than 40 degrees F.

1.08 WARRANTY

A. See Section 01 7800 - Closeout Submittals for additional warranty requirements.

B. Correct defective Work within a two year period after Date of Substantial Completion.

C. Manufacturer Warranty: Provide 5-year manufacturer warranty for insulated glass units against seal failure, interpane dusting or misting, and replacement of same. Complete forms in Owner's name and register with manufacturer.

D. Manufacturer Warranty: Provide 2-year manufacturer warranty against defects listed. Complete forms in Owner's name and register with manufacturer or warrantor.

1. Degradation of color finish.
2. Delamination or separation of finish cladding from window member.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. Aluminum Clad Wood Windows:
   1. Marvin; Ultimate Single Hung G2: www.marvin.com/#sle.
   2. Pella Corporation; Reserve - Traditional Single-Hung Window Features: www.pellacommercial.com/#sle.
   3. Quaker Window Products Company; Brighton Series Single Hung: www.quakerresidentialwindows.com/#sle.
   4. Substitutions: See Section 01 6000 - Product Requirements.

2.02 WOOD WINDOWS

A. Wood Windows: Wood frame and sash, factory fabricated and assembled.
   1. Exterior Finish: Metal clad, painted.
   2. Interior Finish: Unfinished, for transparent finish.
   3. Color: As selected by Architect from manufacturer's standard range.
   4. Configuration: As indicated on drawings.
   5. Window Product Types: H (VS) - Hung window (Vertical sliding window), in accordance with AAMA/WDMA/CSA 101/I.S.2/A440.
   6. Factory glazed; dry glazing method.
   7. Wood Species: Fir, preservative treated using treatment type suitable for required finish.
   8. Frame and Sash Members: Mortise and tenon joints. Glue and steel pin joints to hairline fit, weather tight.
   9. Metal Cladding: Formed aluminum, factory finished, factory fit to profile of wood members.
   10. Transparent Finish: Finger joints not permitted in units intended for transparent finish.
   11. Fasteners: Concealed from view.
   12. Insect Screen: Locate on inside of windows.

2.03 COMPONENTS

A. Glazing: Double glazed, clear, Low-E coated, argon filled, with glass thicknesses as recommended by manufacturer for specified wind conditions.

B. Frames: 3 1/4 inch wide by 5 5/8 inch deep profile; flush solid wood glass stops of screw fastened type, sloped for positive drainage.

C. Sills: Extruded aluminum, with 5 inch nominal thickness; sloped for positive drainage; fits under sash and projects at least 1/2 inch beyond exterior face of wall; single piece full width of opening.

D. Stools: Minimum 3/4 inch nominal thickness, wood; fit under sash to project 1/2 inch beyond interior wall face; one piece full width of opening.

E. Muntins/Grilles: Grilles permanently installed on outside and inside faces of insulating glass.
   1. Pattern: 4 lites in each sash.
   2. Bar Width: 3/4 inch.
   3. Color: Match interior and exterior of frame.

F. Insect Screens: Extruded aluminum frame with mitered and reinforced corners; screen mesh taut and secure to frame; secured to window with adjustable supports allowing screen removal without use of tools.
   1. Supports: Spring-loaded steel pins; four per screen unit.
   2. Screen Mesh: Vinyl-coated fiberglass, window manufacturer's standard mesh.
   3. Frame Finish: Baked enamel, color to match window interior color.

G. Operable Sash Weatherstripping: Wool pile; permanently resilient, profiled to effect weather seal.

H. Fasteners: Stainless steel.

I. Sealant and Backing Materials: See Section 07 9200 of types as indicated.

J. Wood for Casings and Trim: Clear fir, clear preservative treated, of type suitable for required finish.
   1. Finger joints not permitted in transparent finished exposed surfaces.

K. Flashing: Provide related flashings, with necessary anchors and attachment devices. Provide

L. Sealant for Setting Sills, Stools, Aprons, and Sill Flashing: Non-curing butyl type.

2.04 PERFORMANCE REQUIREMENTS

A. Comply with AAMA/WDMA/CSA 101/I.S.2/A440 requirements for the specific window type in accordance with the following:
   1. Performance Class (PC): R.

B. Design Pressure (DP): In accordance with applicable codes.

2.05 HARDWARE

A. Sash lock: Lever handle with cam lock.

B. Operator: Lever action handle fitted to projecting sash arms with limit stops; baked enamel finish.

C. Projecting Sash Arms: Cadmium plated steel, friction pivot joints with nylon bearings, removable pivot clips for cleaning.

D. Window Opening Control Devices (WOCD): Provide operable window sash hardware that limits openings to only allow passage of 4 inch diameter rigid sphere or less, and are easily releasable to fully open without use of keys, tools, or special knowledge.

E. Pulls: Manufacturer's standard type.

2.06 ALUMINUM FINISHES

A. Pigmented Organic Coatings: AAMA 2603, polyester or acrylic baked enamel finish.

B. Color: To be selected by Architect from manufacturer's standard range.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify wall openings and adjoining water-resistive barrier materials are ready to receive wood windows; see Section 07 2500.

3.02 INSTALLATION

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

B. Attach window frame and shims to perimeter opening to accommodate construction tolerances and other irregularities.

C. Align window plumb and level, free of warp or twist. Maintain dimensional tolerances and alignment with adjacent work.

D. Set sill members and sill flashing in continuous bead of sealant.

E. Provide thermal isolation where components penetrate or disrupt building insulation. Pack fibrous insulation in shim spaces at perimeter of assembly to maintain continuity of thermal barrier.

F. Finish interior surfaces with transparent materials; see Section 09 9300.

3.03 ADJUSTING

A. Adjust hardware for smooth operation and secure weathertight closure.

3.04 CLEANING

A. Remove protective material from factory finished surfaces.

B. Wash surfaces by method recommended and acceptable to window manufacturer; rinse and wipe surfaces clean.

END OF SECTION

SECTION 08 7100
DOOR HARDWARE

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Hardware for wood and hollow metal doors.

B. Thresholds.

C. Weatherstripping and gasketing.

1.02 RELATED REQUIREMENTS

A. Section 08 1113 - Hollow Metal Doors and Frames.

B. Section 08 1416 - Flush Wood Doors.

1.03 REFERENCE STANDARDS

A. ADA Standards - 2010 ADA Standards for Accessible Design 2010.

B. BHMA A156.1 - Standard for Butts and Hinges 2021.

C. BHMA A156.3 - Exit Devices 2020.

D. BHMA A156.5 - Cylinders and Input Devices for Locks 2020.

E. BHMA A156.13 - Mortise Locks & Latches Series 1000 2017.

F. BHMA A156.16 - Auxiliary Hardware 2018.

G. BHMA A156.17 - Self Closing Hinges & Pivots 2019.

H. BHMA A156.18 - Materials and Finishes 2020.

I. BHMA A156.21 - Thresholds 2019.

J. BHMA A156.22 - Standard for Gasketing 2021.

K. BHMA A156.36 - Auxiliary Locks 2020.

L. BHMA A156.115 - Hardware Preparation in Steel Doors and Steel Frames 2016.

M. BHMA A156.115W - Hardware Preparation in Wood Doors with Wood or Steel Frames 2006.

N. ICC A117.1 - Accessible and Usable Buildings and Facilities 2017.

O. NFPA 80 - Standard for Fire Doors and Other Opening Protectives 2022.

P. NFPA 101 - Life Safety Code Most Recent Edition Adopted by Authority Having Jurisdiction, Including All Applicable Amendments and Supplements.

Q. UL (DIR) - Online Certifications Directory Current Edition.

1.04 ADMINISTRATIVE REQUIREMENTS

A. Coordinate the manufacture, fabrication, and installation of products that door hardware is installed on.

B. Sequence installation to ensure utility connections are achieved in an orderly and expeditious manner.

C. Furnish templates for door and frame preparation to manufacturers and fabricators of products requiring internal reinforcement for door hardware.

1.05 SUBMITTALS

A. See Section 01 3000 - Administrative Requirements for submittal procedures.

B. Product Data: Manufacturer's catalog literature for each type of hardware, marked to clearly show products to be furnished for this project, and includes construction details, material descriptions, finishes, and dimensions and profiles of individual components.

C. Shop Drawings - Door Hardware Schedule: Submit detailed listing that includes each item of hardware to be installed on each door. Use door numbering scheme as included in Contract Documents.

1. Prepared by or under supervision of Architectural Hardware Consultant (AHC).
2. Provide complete description for each door listed.
3. Provide manufacturer name, product names, and catalog numbers; include functions, types, styles, sizes and finishes of each item.
4. Include account of abbreviations and symbols used in schedule.

D. Manufacturer's Installation Instructions: Indicate special procedures and perimeter conditions requiring special attention.

E. Maintenance Data: Include data on operating hardware, lubrication requirements, and inspection procedures related to preventative maintenance.

F. Keying Schedule:
1. Submit Keying Schedule in compliance with requirements established during Keying Requirements Meeting unless otherwise indicated.

G. Specimen warranty.

1.06 QUALITY ASSURANCE

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

B. Installer Qualifications: Company specializing in performing work of the type specified for commercial door hardware with at least three years of documented experience.

C. Supplier Qualifications: Company with certified Architectural Hardware Consultant (AHC) and Electrified Hardware Consultant (EHC) to assist in work of this section.

1.07 DELIVERY, STORAGE, AND HANDLING

A. Package hardware items individually; label and identify each package with door opening code to match door hardware schedule.

1.08 WARRANTY

A. See Section 01 7800 - Closeout Submittals for additional warranty requirements.

B. Manufacturer's Warranty: Provide warranty against defects in material and workmanship for period indicated. Complete forms in Owner's name and register with manufacturer.
1. Closers: Five years, minimum.
2. Exit Devices: Three years, minimum.
3. Locksets and Cylinders: Three years, minimum.
4. Other Hardware: Two years, minimum.

PART 2 PRODUCTS

2.01 DESIGN AND PERFORMANCE CRITERIA

A. Provide specified door hardware as required to make doors fully functional, compliant with applicable codes, and secure to extent indicated.

B. Provide individual items of single type, of same model, and by same manufacturer.

C. Provide door hardware products that comply with the following requirements:
1. Applicable provisions of federal, state, and local codes.
2. Accessibility: ADA Standards and ICC A117.1.
3. Applicable provisions of NFPA 101.
4. Hardware Preparation for Steel Doors and Steel Frames: BHMA A156.115.
5. Hardware Preparation for Wood Doors with Wood or Steel Frames: BHMA A156.115W.

D. Lock Function: Provide lock and latch function numbers and descriptions of manufacturer's series. See shop drawing submittal of Door Hardware Schedule.

E. Fasteners:
1. Provide fasteners of proper type, size, quantity, and finish that comply with commercially recognized standards for proposed applications.
a. Aluminum fasteners are not permitted.

b. Provide phillips flat-head screws with heads finished to match door surface hardware unless otherwise indicated.

2. Provide machine screws for attachment to reinforced hollow metal and aluminum frames.
   a. Self-drilling (Tek) type screws are not permitted.
3. Provide stainless steel machine screws and lead expansion shields for concrete and masonry substrates.
4. Provide wall grip inserts for hollow wall construction.
5. Provide spacers or sex bolts with sleeves for through bolting of hollow metal doors and frames.
6. Fire-Rated Applications: Comply with NFPA 80.
   a. Provide wood or machine screws for hinges mortised to doors or frames, strike plates to frames, and closers to doors and frames.
   b. Provide steel through bolts for attachment of surface mounted closers, hinges, or exit devices to door panels unless proper door blocking is provided.

2.02 HINGES

A. Manufacturers:
   1. McKinney; an Assa Abloy Group company: www.assaabloydss.com/#sle.
   2. Stanley, dormakaba Group: www.stanleyhardwarefordoors.com/#sle.
   3. Substitutions: See Section 01 6000 - Product Requirements.

B. Hinges: Comply with BHMA A156.1, Grade 1.
   1. Provide hinges on every swinging door.
   2. Provide five-knuckle full mortise butt hinges unless otherwise indicated.
   3. Provide ball-bearing hinges at each door with closer.
   4. Provide non-removable pins on exterior outswinging doors.
   5. Provide following quantity of butt hinges for each door:
      a. Doors From 60 inches High up to 90 inches High: Three hinges.
      b. Doors 90 inches High up to 120 inches High: Four hinges.

2.03 PIVOTS

A. Manufacturers:
   1. McKinney or Rixson; an Assa Abloy Group company: www.assaabloydss.com/#sle.
   2. Ives, an Allegion brand: www.allegion.com/us/#sle.

B. Self-Closing Pivots: Comply with BHMA A156.17.

C. Door Weight: Medium; standard openings with up to 650 lbs door weight.

2.04 FLUSH BOLTS

A. Manufacturers:
   1. Adams Rite, an Assa Abloy Group company: www.assaabloydss.com/#sle.
   2. Ives, an Allegion brand: www.allegion.com/us/#sle.
   3. Substitutions: See Section 01 6000 - Product Requirements.

B. Flush Bolts: Comply with BHMA A156.16, Grade 1.
   1. Flush Bolt Throw: 3/4 inch, minimum.
   2. Provides extension bolts in leading edge of door, one bolt into floor, one bolt into top of frame.
      a. Pairs of Swing Doors: At inactive leaves, provide flush bolts of type as required to comply with code.
   3. Manual Flush Bolts: Provide lever extensions for top bolt at over-sized doors.

2.05 EXIT DEVICES

A. Manufacturers:
   1. Corbin Russwin, Sargent, or Yale; an Assa Abloy Group company: www.assaabloydss.com/#sle.
   2. Von Duprin, an Allegion brand: www.allegion.com/us/#sle.
   3. Substitutions: See Section 01 6000 - Product Requirements.

B. Exit Devices: Comply with BHMA A156.3, Grade 1.
   1. Lever design to match lockset trim.
   2. Provide cylinder with cylinder dogging or locking trim.
   3. Provide exit devices properly sized for door width and height.
   4. Provide strike as recommended by manufacturer for application indicated.
   5. Provide UL (DIR) listed exit device assemblies for fire-rated doors and panic device assemblies for non-fire-rated doors.

2.06 LOCK CYLINDERS

A. Lock Cylinders: Provide key access on outside of each lock, unless otherwise indicated.
   1. Provide full size interchangeable core (FSIC) type cylinders, Grade 1, with six-pin core in compliance with BHMA A156.5 at locations indicated.
   2. Provide cylinders from same manufacturer as locking device.
   3. Provide cams and/or tailpieces as required for locking devices.

2.07 MORTISE LOCKS

A. Manufacturers:
   1. Corbin Russwin, Sargent, or Yale; an Assa Abloy Group company www.assaabloydss.com/#sle.
   2. Best, dormakaba Group: www.bestaccess.com/#sle.
   3. Schlage, an Allegion brand: www.allegion.com/us/#sle.
   4. Stanley, dormakaba Group: www.stanleyhardwarefordoors.com/#sle.
   5. Substitutions: See Section 01 6000 - Product Requirements.

B. Mortise Locks: Comply with BHMA A156.13, Grade 1, Security, 1000 Series.
   1. Latchbolt Throw: 3/4 inch, minimum.
   2. Deadbolt Throw: 1 inch, minimum.
   3. Backset: 2-3/4 inch unless otherwise indicated.
   4. Strikes: Provide manufacturer's standard strike for each latchset or lockset with strike box and curved lip extending to protect frame in compliance with indicated requirements.
      a. Finish: To match lock or latch.

2.08 AUXILIARY LOCKS (DEADLOCKS)

A. Manufacturers:
   1. Yale; an Assa Abloy Group company: www.assaabloydss.com/#sle.
   2. Best, dormakaba Group: www.bestaccess.com/#sle.
   3. Substitutions: See Section 01 6000 - Product Requirements.

B. Auxiliary Locks (Deadlocks): Comply with BHMA A156.36, Grade 1.
   1. Type: Bored (cylindrical).
   2. Application: Bored.
   3. Backset: 2-3/4 inch, unless otherwise indicated.
   4. Bolt Throw: 1/2 inch, with latch made of hardened steel.
   5. Provide strike that matches frame.

2.09 FLOOR STOPS

A. Manufacturers:
   1. Rockwood; an Assa Abloy Group company: www.assaabloydss.com/#sle.
   2. Substitutions: See Section 01 6000 - Product Requirements.

B. Floor Stops: Comply with BHMA A156.16, Grade 1 and Resilient Material Retention Test as described in this standard.
   1. Type: Manual hold-open, with dome floor stop.
   2. Material: Aluminum housing with rubber insert.

2.10 WALL STOPS

A. Manufacturers:
   1. Rockwood; an Assa Abloy Group company: www.assaabloydss.com/#sle.

2. Substitutions: See Section 01 6000 - Product Requirements.

B. Wall Stops: Comply with BHMA A156.16, Grade 1 and Resilient Material Retention Test as described in this standard.
   1. Type: Bumper, concave, wall stop.
   2. Material: Aluminum housing with rubber insert.

2.11 THRESHOLDS

A. Manufacturers:
   1. Pemko; an Assa Abloy Group company: www.assaabloydss.com/#sle.
   2. National Guard Products, Inc: www.ngpinc.com/#sle.
   3. Zero International, Inc: www.zerointernational.com/#sle.
   4. Substitutions: See Section 01 6000 - Product Requirements.

B. Thresholds: Comply with BHMA A156.21.
   1. Provide threshold at each exterior door, unless otherwise indicated.
   2. Type: Flat surface.
   3. Material: Aluminum.
   4. Threshold Surface: Fluted horizontal grooves across full width.
   5. Field cut threshold to profile of frame and width of door sill for tight fit.
   6. Provide non-corroding fasteners at exterior locations.

2.12 WEATHERSTRIPPING AND GASKETING

A. Manufacturers:
   1. Pemko; an Assa Abloy Group company: www.assaabloydss.com/#sle.
   2. National Guard Products, Inc: www.ngpinc.com/#sle.
   3. Zero International, Inc: www.zerointernational.com/#sle.
   4. Substitutions: See Section 01 6000 - Product Requirements.

B. Weatherstripping and Gasketing: Comply with BHMA A156.22.
   1. Head and Jamb Type: Adjustable.
   2. Door Sweep Type: Encased in retainer.
   3. Material: Aluminum, with brush weatherstripping.
   4. Provide weatherstripping on each exterior door at head, jambs, and meeting stiles of door pairs, unless otherwise indicated.
   5. Provide door bottom sweep on each exterior door, unless otherwise indicated.

2.13 SILENCERS

A. Silencers: Provide at equal locations on door frame to mute sound of door's impact upon closing.
   1. Single Door: Provide three on strike jamb of frame.
   2. Pair of Doors: Provide two on head of frame, one for each door at latch side.
   3. Material: Rubber, gray color.

2.14 FINISHES

A. Finishes: Provide door hardware of same finish, unless otherwise indicated.
   1. Primary Finish: 626; satin chromium plated over nickel, with brass or bronze base material (former US equivalent US26D); BHMA A156.18.
   2. Exceptions:
      a. Where base material metal is specified to be different, provide finish that is an equivalent appearance in accordance with BHMA A156.18.
      b. Door Closer Covers and Arms: Color as selected by Architect from manufacturer's standard colors unless otherwise indicated.
      c. Aluminum Surface Trim and Gasket Housings: Anodized to match door panel finish, not other hardware, unless otherwise indicated.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify that doors and frames are ready to receive this work; labeled, fire-rated doors and frames are properly installed, and dimensions are as indicated on shop drawings.

B. Verify that electric power is available to power operated devices and of correct characteristics.

3.02 INSTALLATION

A. Install hardware in accordance with manufacturer's instructions and applicable codes.

B. Use templates provided by hardware item manufacturer.

C. Door Hardware Mounting Heights: Distance from finished floor to center line of hardware item. As indicated in following list; unless noted otherwise in Door Hardware Schedule or on drawings.
   1. Mounting heights in compliance with ADA Standards:
      a. Locksets: 40 inch.
      b. Push Plates/Pull Bars: 40 inch.
      c. Deadlocks (Deadbolts): 48 inch.

D. Set exterior door thresholds with full-width bead of elastomeric sealant at each point of contact with floor providing a continuous weather seal; anchor thresholds with stainless steel countersunk screws.

3.03 ADJUSTING

A. Adjust work under provisions of Section 01 7000 - Execution and Closeout Requirements.

B. Adjust hardware for smooth operation.

C. Adjust gasketing for complete, continuous seal; replace if unable to make complete seal.

3.04 CLEANING

A. Clean finished hardware in accordance with manufacturer's written instructions after final adjustments have been made.

B. Clean adjacent surfaces soiled by hardware installation.

C. Replace items that cannot be cleaned to manufacturer's level of finish quality at no additional cost.

3.05 PROTECTION

A. Protect finished Work under provisions of Section 01 7000 - Execution and Closeout Requirements.

B. Do not permit adjacent work to damage hardware or finish.

3.06 DOOR HARDWARE SETS

A. The hardware sets represent the design intent and direction of the owner and architect. They are a guideline only and should not be considered a detailed hardware schedule. Discrepancies, conflicting hardware and missing items should be brought to the attention of the architect with corrections made prior to the bidding process. Omitted items not included in a hardware set should be scheduled with the appropriate additional hardware required for proper application and functionality.
   1. Quantities listed are for each pair of doors, or for each single door.
   2. The supplier is responsible for handing and sizing all products.
   3. Where multiple options for a piece of hardware are given in a single line item, the supplier shall provide the appropriate application for the opening.

B. Hardware Sets

SET 1.0 (Door 102)

Enrance Lockset
3 - hinges
Floor Stop
Threshold

Door Bottom
Weatherstripping
Rain Drip

END OF SECTION

SECTION 09 9000
PAINTING AND COATING

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Surface preparation.

B. Interior painting and coating systems.

C. Exterior painting and coating systems.

D. Scope:
   1. Finish surfaces exposed to view, unless fully factory-finished and unless otherwise indicated, including the following:
      a. Exterior:
         1) Masonry: Concrete masonry units (CMU), cinder or concrete block.
         2) Metal: galvanized.
         3) Metal, Miscellaneous: ferrous metal.
         4) Wood: Siding, trim, shutters, sashes, and hardboard-bare/primed.
      b. Interior:
         1) Metal: Steel, galvanized.
         2) Metal, Galvanized: Ceilings and ductwork.
         3) Metal: Structural steel columns, joists, trusses, beams, miscellaneous and ornamental iron, structural iron, and ferrous metal.
         4) Wood: Walls, ceilings, doors, and trim.
         5) Drywall: Walls, ceilings, gypsum board, and similar items.

1.02 RELATED REQUIREMENTS

A. Section 05 5000 - Metal Fabrications: Shop-primed items.

1.03 REFERENCE STANDARDS

A. SSPC-SP 1 - Solvent Cleaning 2015, with Editorial Revision (2016).

B. SSPC-SP 6 - Commercial Blast Cleaning 2007.

1.04 SUBMITTALS

A. See Section 01 3000 - Administrative Requirements for submittal procedures.

B. Product Data: Provide complete list of products to be used, with the following information for each:
   1. Product characteristics.
   2. Surface preparation instructions and recommendations.
   3. Primer requirements and finish specification.
   4. Storage and handling requirements and recommendations.
   5. Application methods.
   6. Clean-up information.

C. Samples: Submit four paper draw down samples, 8-1/2 by 11 inches in size, illustrating range of colors available for each finishing product specified.

1.05 QUALITY ASSURANCE

A. Applicator Qualifications: Company specializing in performing the type of work specified with minimum 3 years experience and approved by manufacturer.

1.06 DELIVERY, STORAGE, AND HANDLING

A. Deliver products to site in sealed and labeled containers; inspect to verify acceptability.

B. Container Label: Include manufacturer's name, type of paint, product name, product code, color designation, VOC content, batch date, environmental handling, surface preparation, application, and use instructions.

C. Paint Materials: Store at a minimum of 45 degrees F and a maximum of 90 degrees F, in ventilated area, and as required by manufacturer's instructions.

D. Handling: Maintain a clean, dry storage area to prevent contamination or damage to materials.

1.07 FIELD CONDITIONS

A. Do not apply materials when environmental conditions are outside the ranges required by manufacturer.

B. Follow manufacturer's recommended procedures for producing the best results, including testing of substrates, moisture in substrates, and humidity and temperature limitations.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. Basis of Design Products: Subject to compliance with requirements, provide Sherwin-Williams Company (The) products indicated; www.sherwin-williams.com/#sle.

B. Comparable Products: Products of approved manufacturers will be considered in accordance with 01 6000 - Product Requirements, and the following:

2.02 PAINTINGS AND COATINGS

A. General:
   1. Provide factory-mixed coatings unless otherwise indicated.
   2. Do not reduce, thin, or dilute coatings or add materials to coatings unless specifically indicated in manufacturer's instructions.

B. Accessory Materials: Provide primers, sealers, cleaning agents, cleaning cloths, sanding materials, and clean-up materials as required for final completion of painted surfaces.

2.03 PAINT SYSTEMS - EXTERIOR

A. Brick Masonry and Cementitious surfaces:
   1. Alkyd Systems: Brick masonry, concrete and new parge coating.
      a. Semi-Gloss Finish:
         1) 1st Coat: Previously painted Surfaces
            (a) Surface preparation and primer coat as per manufacturers recommendations.
         2) 1st Coat: Concrete, Parge Coat and cementitious surfaces.
            (a) Heavy Duty Block Filler
         3) 2nd and 3rd Coat: Silicone Aykld Enamel MIL-PRF 24635, N40400 Type II: www.sherwin-williams.com/#sle.
            (a) Finish: Semi Gloss
            (b) Color: Match Existing
            (c) Volume Solids: 58% minimum
            (d) Weight Solids: 71% minimum

B. Metal: Galvanized.
   1. Alkyd Systems, Water Based:
      a. Semi-Gloss Finish:
         1) 1st Coat: Sherwin-Williams Pro Industrial Pro-Cryl Universal Primer, B66-1310 Series: www.sherwin-williams.com/#sle.
            (a) 5 mils wet, 2 mils dry per coat.
         2) 2nd and 3rd Coat: Sherwin-Williams Pro Industrial Water Based Alkyd Urethane Enamel Semi-Gloss, B53-1150 Series: www.sherwin-williams.com/#sle.
            (a) 4 to 5 mils wet, 1.4 to 1.7 mils dry per coat.

C. Metal, Miscellaneous: Iron, ornamental iron, structural iron and steel, ferrous metal.
   1. Alkyd Systems, Water Based:
      a. Semi-Gloss Finish:
         1) 1st Coat: Sherwin-Williams Pro Industrial Pro-Cryl Universal Primer, B66-1310 Series: www.sherwin-williams.com/#sle.
            (a) 5 mils wet, 2 mils dry per coat.
         2) 2nd and 3rd Coat: Sherwin-Williams Pro Industrial Water Based Alkyd Urethane Enamel Semi-Gloss, B53-1150 Series: www.sherwin-williams.com/#sle.

(a) 4 to 5 mils wet, 1.4 to 1.7 mils dry per coat.

D. Wood: Siding, trim, shutters, sashes, and hardboard-bare/primed.
1. Latex Systems:
a. Satin Finish:
1) 1st Coat: Sherwin-Williams Latex Wood Primer, B42W8041: www.sherwin-williams.com/#sle.
2) 2nd and 3rd Coat: Sherwin-Williams A-100 Exterior Latex Satin, A82 Series: www.sherwin-williams.com/#sle.

2.04 PAINT SYSTEMS - INTERIOR

A. Metal: Galvanized.
1. Alkyd Systems, Water Based:
a. Semi-Gloss Finish:
1) 1st Coat: Sherwin-Williams Pro Industrial Pro-Cryl Universal Primer, B66-1310 Series: www.sherwin-williams.com/#sle.
2) 2nd and 3rd Coat: Sherwin-Williams Pro Industrial Water Based Alkyd Urethane Enamel Semi-Gloss, B53-1150 Series: www.sherwin-williams.com/#sle.

B. Wood: Door and window and trim.
1. Latex Systems:
a. Eg-Shel/Satin Finish:
1) 1st Coat: Sherwin-Williams Premium Wall and Wood Primer, B28W8111: www.sherwin-williams.com/#sle.
(a) 4 mils wet, 1.8 mils dry per coat.
2) 2nd and 3rd Coat: Sherwin-Williams ProClassic Waterborne Acrylic Satin, B20 Series: www.sherwin-williams.com/#sle.
(a) 4 mils wet, 1.2 mils dry per coat.

C. Drywall: Walls, ceilings, gypsum board, and similar items.
1. Latex Systems:
a. Eg-Shel Finish:
1) 1st Coat: Sherwin-Williams ProMar 200 Zero VOC Interior Latex Primer, B28W2600: www.sherwin-williams.com/#sle.
2) 2nd and 3rd Coat: Sherwin-Williams ProMar 200 Zero VOC Eg-Shel, B20-2600 Series: www.sherwin-williams.com/#sle.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify that surfaces are ready to receive work as instructed by the product manufacturer.

B. Test shop-applied primer for compatibility with subsequent cover materials.

3.02 PREPARATION

A. Clean surfaces thoroughly and correct defects prior to application.

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

C. Remove mildew from impervious surfaces by scrubbing with solution of water and bleach. Rinse with clean water and allow surface to dry.

D. Gypsum Board: Fill minor defects with filler compound; sand smooth and remove dust prior to painting.

E. Galvanized Surfaces:
1. Remove surface contamination and oils and wash with solvent according to SSPC-SP 1.

F. Ferrous Metal:
1. Solvent clean according to SSPC-SP 1.
2. Remove rust, loose mill scale, and other foreign substances using methods recommended by paint manufacturer and blast cleaning according to SSPC-SP 6. Protect from corrosion until

coated.

G. Wood: Remove dust, grit, and foreign matter. Scrape, sand, and spot prime knots and pitch streaks. Fill nail holes and imperfections with wood filler and sand smooth.

3.03 APPLICATION

A. Remove unfinished louvers, grilles, covers, and access panels on mechanical and electrical components and paint separately.

B. Apply products in accordance with manufacturer's written instructions.

C. Apply coatings at spread rate required to achieve manufacturer's recommended dry film thickness.

D. Regardless of number of coats specified, apply additional coats until complete hide is achieved.

3.04 PRIMING

A. Apply primer to all surfaces unless specifically not required by coating manufacturer. Apply in accordance with coating manufacturer's instructions.

B. Primers specified in painting schedules may be omitted on items that are factory primed or factory finished if acceptable to top coat manufacturers.

3.05 CLEANING

A. Collect waste material that could constitute a fire hazard, place in closed metal containers, and remove daily from site.

B. Clean surfaces immediately of overspray, splatter, and excess material.

C. After coating has cured, clean and replace finish hardware, fixtures, and fittings previously removed.

3.06 PROTECTION

A. Protect finished coatings from damage until completion of project.

B. Touch-up damaged finishes after Substantial Completion.

END OF SECTION

SECTION 31 2200
GRADING

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Removal and storage of topsoil.

B. Rough grading the site for concrete foundation repair.

C. Finish grading for planting.

1.02 RELATED REQUIREMENTS

A. Section 31 2316 - Excavation.

B. Section 31 2323 - Fill: Filling and compaction.

C. Section 32 9223 - Sodding: Finish ground cover.

1.03 SUBMITTALS

A. Project Record Documents: Accurately record actual locations of utilities remaining by horizontal dimensions, elevations or inverts, and slope gradients.

PART 2 PRODUCTS

2.01 MATERIALS

A. Topsoil: Topsoil excavated on-site.

B. Other Fill Materials: See Section 31 2323.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify that survey bench mark and intended elevations for the Work are as indicated.

B. Verify the absence of standing or ponding water.

3.02 PREPARATION

A. Identify required lines, levels, contours, and datum.

B. Stake and flag locations of known utilities.

C. Locate, identify, and protect from damage above- and below-grade utilities to remain.

D. Provide temporary means and methods to remove all standing or ponding water from areas prior to grading.

3.03 ROUGH GRADING

A. Remove topsoil from areas to be further excavated, re-landscaped, or re-graded, without mixing with foreign materials.

B. Do not remove topsoil when wet.

C. Remove subsoil from areas to be further excavated, re-landscaped, or re-graded.

D. Do not remove wet subsoil , unless it is subsequently processed to obtain optimum moisture content.

E. When excavating through roots, perform work by hand and cut roots with sharp axe.

F. Stability: Replace damaged or displaced subsoil to same requirements as for specified fill.

G. Remove and replace soils deemed unsuitable by classification and which are excessively moist due to lack surface water control.

3.04 SOIL REMOVAL

A. Stockpile excavated topsoil on site.

B. Stockpile excavated subsoil on site.

C. Stockpiles: Use areas designated on site; pile depth not to exceed 8 feet; protect from erosion.

3.05 FINISH GRADING

A. Before Finish Grading:
   1. Verify building and trench backfilling have been inspected.
   2. Verify subgrade has been contoured and compacted.

B. Remove debris, roots, branches, stones, in excess of 1/2 inch in size. Remove soil contaminated with petroleum products.

C. In areas where vehicles or equipment have compacted soil, scarify surface to depth of 3 inches.

D. Place topsoil to the following compacted thicknesses:
   1. At all areas of disturbed soil to be Sodded: 4 inches.

E. Place topsoil during dry weather.

F. Remove roots, weeds, rocks, and foreign material while spreading.

G. Fine grade topsoil to eliminate uneven areas and low spots. Maintain profiles and contour of subgrade.

H. Maintain stability of topsoil during inclement weather. Replace topsoil in areas where surface water has eroded thickness below specifications.

3.06 REPAIR AND RESTORATION

A. Existing Facilities, Utilities, and Site Features to Remain: If damaged due to this work, repair or replace to original condition.

3.07 FIELD QUALITY CONTROL

A. See Section 31 2323 for compaction density testing.

3.08 CLEANING

A. Remove unused stockpiled topsoil and subsoil. Grade stockpile area to prevent standing water.

B. Leave site clean and raked, ready to receive landscaping.

END OF SECTION

SECTION 31 2316.13
TRENCHING

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Backfilling and compacting for utilities outside the building for storm sewer lines to daylight..

1.02 RELATED REQUIREMENTS

A. Section 31 0519 - Geosynthetics for Earthwork.

B. Section 31 2200 - Grading: Site grading.

C. Section 31 2316 - Excavation: Building and foundation excavating.

1.03 REFERENCE STANDARDS

A. ASTM C136/C136M - Standard Test Method for Sieve Analysis of Fine and Coarse Aggregates 2019.

B. ASTM D2487 - Standard Practice for Classification of Soils for Engineering Purposes (Unified Soil Classification System) 2017, with Editorial Revision (2020).

PART 2 PRODUCTS

2.01 FILL MATERIALS

A. General Fill: Subsoil excavated on-site.
   1. Free of lumps larger than 3 inches, rocks larger than 2 inches, and debris.
   2. Complying with ASTM D2487 Group Symbol CL.

B. Structural Fill: Subsoil excavated on-site.
   1. Free of lumps larger than 3 inches, rocks larger than 2 inches, and debris.
   2. Complying with ASTM D2487 Group Symbol CL.

C. Granular Fill - Gravel: Pit run washed stone; free of shale, clay, friable material and debris.
   1. Graded in accordance with ASTM C136/C136M, within the following limits:
      a. 3/8 inch sieve: 55 to 85 percent passing.

D. Granular Fill - Pea Gravel: Natural stone; washed, free of clay, shale, organic matter.
   1. Graded in accordance with ASTM C136/C136M, within the following limits:
      a. Minimum Size: 1/4 inch.
      b. Maximum Size: 5/8 inch.

E. Topsoil: See Section 31 2200.

F. Topsoil: Topsoil excavated on-site.
   1. Free of roots, rocks larger than 1/2 inch, subsoil, debris, large weeds and foreign matter.

2.02 ACCESSORIES

A. Geotextile: Non-biodegradable, nonwoven.

2.03 SOURCE QUALITY CONTROL

A. See Section 01 4000 - Quality Requirements, for general requirements for testing and analysis of soil material.

B. If tests indicate materials do not meet specified requirements, change material and retest.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify that survey bench marks and intended elevations for the work are as indicated.

3.02 PREPARATION

A. Identify existing and new required lines, levels, contours, and datum locations.

B. Grade top perimeter of trenching area to prevent surface water from draining into trench. Provide temporary means and methods, as required, to maintain surface water diversion until no longer

needed, or as directed by the Architect.

3.03 TRENCHING

A. Notify Architect of unexpected subsurface conditions and discontinue affected Work in area until notified to resume work.

B. Slope banks of excavations deeper than 4 feet to angle of repose or less until shored.

C. Do not interfere with 45 degree bearing splay of foundations.

D. Cut trenches wide enough to allow inspection of installed utilities.

E. Hand trim excavations. Remove loose matter.

F. Remove excavated material that is unsuitable for re-use from site.

G. Remove excess excavated material from site.

H. Provide temporary means and methods, as required, to remove all water from trenching until directed by the Architect. Remove and replace soils deemed unsuitable by classification and which are excessively moist due to lack of dewatering or surface water control.

I. Determine the prevailing groundwater level prior to trenching. If the proposed trench extends less than 1 foot into the prevailing groundwater, control groundwater intrusion with perimeter drains routed to sump pumps, or as directed by the Architect.

3.04 PREPARATION FOR UTILITY PLACEMENT

A. Cut out soft areas of subgrade not capable of compaction in place. Backfill with general fill.

B. Compact subgrade to density equal to or greater than requirements for subsequent fill material.

C. Until ready to backfill, maintain excavations and prevent loose soil from falling into excavation.

3.05 BACKFILLING

A. Backfill to contours and elevations indicated using unfrozen materials.

B. Employ a placement method that does not disturb or damage other work.

C. Systematically fill to allow maximum time for natural settlement. Do not fill over porous, wet, frozen or spongy subgrade surfaces.

D. Maintain optimum moisture content of fill materials to attain required compaction density.

E. Slope grade away from building minimum 2 inches in 10 feet, unless noted otherwise. Make gradual grade changes. Blend slope into level areas.

F. Correct areas that are over-excavated.
   1. Other areas: Use general fill, flush to required elevation, compacted to minimum 97 percent of maximum dry density.

G. Compaction Density Unless Otherwise Specified or Indicated:

H. Reshape and re-compact fills subjected to vehicular traffic.

3.06 BEDDING AND FILL AT SPECIFIC LOCATIONS

A. Use general fill unless otherwise specified or indicated.

B. Over Subdrainage Piping at Foundation Perimeter:
   1. Drainage fill and geotextile: Section 31 0519.
   2. Cover drainage fill with general fill.
   3. Compact to 95 percent of maximum dry density.

3.07 CLEANING

A. Remove unused stockpiled materials, leave area in a clean and neat condition. Grade stockpile area to prevent standing surface water.

END OF SECTION

SECTION 31 2316
EXCAVATION

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Excavating for footings.

B. Trenching for utilities outside the building for storm sewer to daylight..

C. Temporary excavation support and protection systems.

1.02 RELATED REQUIREMENTS

A. Section 01 5713 - Temporary Erosion and Sediment Control: Slope protection and erosion control.

B. Section 31 2200 - Grading: Soil removal from surface of site.

C. Section 31 2200 - Grading: Grading.

D. Section 31 2316.13 - Trenching: Excavating for utility trenches outside the building to utility main connections.

E. Section 31 2323 - Fill: Fill materials, backfilling, and compacting.

1.03 REFERENCE STANDARDS

A. 29 CFR 1926 - Safety and Health Regulations for Construction Current Edition.

1.04 SUBMITTALS

A. See Section 01 3000 - Administrative Requirements, for submittal procedures.

B. Temporary Support and Excavation Protection Plan.

1.05 QUALITY ASSURANCE

A. Temporary Support and Excavation Protection Plan:
   1. Indicate sheeting, shoring, and bracing materials and installation required to protect excavations and adjacent structures and property.

PART 2 PRODUCTS

2.01 MATERIALS

A. Bedding and Fill to Correct Over-Excavation:

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify that survey bench mark and intended elevations for the work are as indicated.

B. Survey existing adjacent structures and improvements and establish exact elevations at fixed points to act as benchmarks.

C. Determine the prevailing groundwater level prior to excavation. If the proposed excavation extends less than 1 foot into the prevailing groundwater, control groundwater intrusion with perimeter drains routed to sump pumps, or as directed by Architect. If the proposed excavation extends more than 1 foot into the prevailing groundwater, control groundwater intrusion with a comprehensive dewatering procedures, or as directed by Geotechnical Engineer.

3.02 PREPARATION

A. Identify esisting lines, levels, contours, and datum locations.

B. Locate, identify, and protect utilities that remain and protect from damage.

C. Grade top perimeter of excavation to prevent surface water from draining into excavation. Provide temporary means and methods, as required, to maintain surface water diversion until no longer needed, or as directed by Architect.

3.03 TEMPORARY EXCAVATION SUPPORT AND PROTECTION

A. Excavation Safety: Comply with OSHA’s Excavation Standard, 29 CFR 1926, Subpart P.

1. Excavations in stable rock or in less than 5 feet in depth in ground judged as having no cave-in potential do not require excavation support and protection systems.
2. Depending upon excavation depth, time that excavation is open, soil classification, configuration and slope of excavation sidewalls, design and provide an excavation support and protection system that meets the requirements of 29 CFR 1926, Subpart P:

3.04 EXCAVATING

A. Excavate to accommodate new structures and construction operations.
   1. Excavate to the length and width required to safely install, adjust, and remove any forms, bracing, or supports necessary for the installation of the work.
   2. Cut utility trenches wide enough to allow inspection of installed utilities.

B. Notify Architect of unexpected subsurface conditions and discontinue affected Work in area until notified to resume work.

C. Do not interfere with 45 degree bearing splay of foundations.

D. Provide temporary means and methods, as required, to remove all water from excavations until directed by Architect. Remove and replace soils deemed suitable by classification and which are excessively moist due to lack of dewatering or surface water control.

3.05 FILLING AND BACKFILLING

A. Do not fill or backfill until all debris, water, unsatisfactory soil materials, obstructions, and deleterious materials have been removed from excavation.

B. See Section 31 2323 for fill, backfill, and compaction requirements at general excavations.

C. See Section 31 2316.13 for fill, backfill, and compaction requirements at utility trenches.

D. See Section 31 2200 for rough and final grading and topsoil replacement requirements.

3.06 REPAIR

A. Correct areas that are over-excavated and load-bearing surfaces that are disturbed; see Section 31 2323.

3.07 CLEANING

A. Stockpile excavated material to be re-used in area designated on site in accordance with Section 31 2200.

B. Remove excavated material that is unsuitable for re-use from site.

C. Remove excess excavated material from site.

3.08 PROTECTION

A. Divert surface flow from rains or water discharges from the excavation.

B. Prevent displacement of banks and keep loose soil from falling into excavation; maintain soil stability.

C. Protect open excavations from rainfall, runoff, freezing groundwater, or excessive drying so as to maintain foundation subgrade in satisfactory, undisturbed condition.

D. Protect bottom of excavations and soil adjacent to and beneath foundation from freezing.

E. Keep excavations free of standing water and completely free of water during concrete placement.

END OF SECTION

SECTION 31 2323
FILL

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Filling, backfilling, and compacting for building volume below grade and footings.

B. Filling holes, pits, and excavations generated as a result of removal (demolition) operations.

1.02 RELATED REQUIREMENTS

A. Section 31 2200 - Grading: Removal and handling of soil to be re-used.

B. Section 31 2200 - Grading: Site grading.

C. Section 31 2316 - Excavation: Removal and handling of soil to be re-used.

D. Section 31 2316.13 - Trenching: Excavating for utility trenches outside the building for storm drain lines to daylight..

E. Section 33 4100 - Subdrainage: Filter aggregate and filter fabric for foundation drainage systems.

1.03 REFERENCE STANDARDS

A. ASTM C136/C136M - Standard Test Method for Sieve Analysis of Fine and Coarse Aggregates 2019.

B. ASTM D2487 - Standard Practice for Classification of Soils for Engineering Purposes (Unified Soil Classification System) 2017, with Editorial Revision (2020).

1.04 SUBMITTALS

A. See Section 01 3000 - Administrative Requirements, for submittal procedures.

B. Materials Sources: Submit name of imported materials source.

C. Fill Composition Test Reports: Results of laboratory tests on proposed and actual materials used.

D. Compaction Density Test Reports.

1.05 DELIVERY, STORAGE, AND HANDLING

A. When necessary, store materials on site in advance of need.

B. When fill materials need to be stored on site, locate stockpiles where as directed by the Owner..
   1. Separate differing materials with dividers or stockpile separately to prevent intermixing.
   2. Prevent contamination.
   3. Protect stockpiles from erosion and deterioration of materials.

1.06 WARRANTY

A. See Section 01 7800 - Closeout Submittals, for additional warranty requirements.

B. Correct defective Work within a five year period after Date of Substantial Completion.

PART 2 PRODUCTS

2.01 FILL MATERIALS

A. General Fill: Subsoil excavated on-site.
   1. Free of lumps larger than 3 inches, rocks larger than 2 inches, and debris.
   2. Complying with ASTM D2487 Group Symbol CL.

B. Structural Fill: Subsoil excavated on-site.
   1. Free of lumps larger than 3 inches, rocks larger than 2 inches, and debris.
   2. Complying with ASTM D2487 Group Symbol CL.

C. Granular Fill - Gravel : Pit run washed stone; free of shale, clay, friable material and debris.
   1. Graded in accordance with ASTM C136/C136M, within the following limits:
      a. 3/8 inch sieve: 55 to 85 percent passing.

D. Granular Fill - Pea Gravel: Natural stone; washed, free of clay, shale, organic matter.
   1. Graded in accordance with ASTM C136/C136M, within the following limits:

a. Minimum Size: 1/4 inch.
b. Maximum Size: 5/8 inch.

E. Topsoil: Topsoil excavated on-site.
1. Free of roots, rocks larger than 1/2 inch, subsoil, debris, large weeds and foreign matter.
2. Acidity range (pH) of 5.5 to 7.5.
3. Containing a minimum of 4 percent and a maximum of 25 percent inorganic matter.

2.02 ACCESSORIES

A. Geotextile: Non-biodegradable, nonwoven.

2.03 SOURCE QUALITY CONTROL

A. See Section 01 4000 - Quality Requirements, for general requirements for testing and analysis of soil material.

B. Where fill materials are specified by reference to a specific standard, test and analyze samples for compliance before delivery to site.

C. If tests indicate materials do not meet specified requirements, change material and retest.

PART 3 EXECUTION

3.01 EXAMINATION

A. Identify existing and new required lines, levels, contours, and datum locations.

B. Verify areas to be filled are not compromised with surface or ground water.

3.02 PREPARATION

A. Scarify and proof roll subgrade surface to a depth of 6 inches to identify soft spots.

B. Cut out soft areas of subgrade not capable of compaction in place. Backfill with general fill.

C. Compact subgrade to density equal to or greater than requirements for subsequent fill material.

D. Until ready to fill, maintain excavations and prevent loose soil from falling into excavation.

3.03 FILLING

A. Fill to contours and elevations indicated using unfrozen materials.

B. Employ a placement method that does not disturb or damage other work.

C. Systematically fill to allow maximum time for natural settlement. Do not fill over porous, wet, frozen or spongy subgrade surfaces.

D. Maintain optimum moisture content of fill materials to attain required compaction density.

E. Granular Fill: Place and compact materials in equal continuous layers not exceeding 6 inches compacted depth.

F. Soil Fill: Place and compact material in equal continuous layers not exceeding 8 inches compacted depth.

G. Slope grade away from building minimum 2 inches in 10 feet, unless noted otherwise. Make gradual grade changes. Blend slope into level areas.

H. Correct areas that are over-excavated.
1. Other areas: Use general fill, flush to required elevation, compacted to minimum 97 percent of maximum dry density.

I. Compaction Density Unless Otherwise Specified or Indicated:
1. At all locations of fill: 95 percent of maximum dry density.

J. Reshape and re-compact fills subjected to vehicular traffic.

K. Maintain temporary means and methods, as required, to remove all water while fill is being placed as required, or until directed by the Architect. Remove and replace soils deemed unsuitable by classification and which are excessively moist due to lack of dewatering or surface water control.

3.04 FILL AT SPECIFIC LOCATIONS

A. Structural Fill:
   1. Maximum depth per lift: 6 inches, compacted.
   2. Compact to minimum 95 percent of maximum dry density.

B. Pervious Structural Fill:
   1. Use granular fill.
   2. Maximum depth per lift: 6 inches, compacted.
   3. Compact to minimum 95 percent of maximum dry density.

C. At Foundation Walls and Footings:
   1. Use general fill.
   2. Fill up to subgrade elevation.
   3. Compact each lift to 90 percent of maximum dry density.
   4. Do not backfill against unsupported foundation walls.

D. Over Subdrainage Piping at Foundation Perimeter:
   1. Drainage fill and geotextile: Section 31 2316.13 .
   2. Cover drainage fill with general fill.
   3. Compact to 95 percent of maximum dry density.

E. At Lawn Areas:
   1. Use general fill.
   2. Fill up to 6 inches below finish grade elevations.
   3. Compact to 95 percent of maximum dry density.
   4. See Section 31 2200 for topsoil placement.

F. At French Drains:
   1. Use granular fill.
   2. Compact to 95 percent of maximum dry density.

3.05 CLEANING

A. See Section 01 7419 - Construction Waste Management and Disposal, for additional requirements.

B. Remove unused stockpiled materials, leave area in a clean and neat condition. Grade stockpile area to prevent standing surface water.

END OF SECTION

SECTION 32 9223
SODDING

PART 1 - GENERAL

1.01 WORK INCLUDED

A. Preparation of planting surface.

B. Fertilizing.

C. Sod installation.

D. Maintenance service.

1.02 RELATED WORK

A. Section 312216 – Landscape Grading: Preparation of subsoil and placement of topsoil in preparation for the work of this Section.

B. Section 328400 – Planting Irrigation

C. Section 329300 - Plants.

1.03 REFERENCES

A. Standardized Plant Names, 1942 Edition, American Joint Committee on Horticulture Nomenclature.

B. ASPA (American Sod Producers Association) - Guideline Specifications to Sodding.

C. FSO-F-241 - Fertilizers, Mixed, Commercial.

1.04 DEFINITIONS

A. Weeds: Includes Dandelion, Jimsonweed, Quackgrass, Horsetail, Morning Glory, Rush Grass, Mustard, Lambsquarter, Chickweed, Cress, Crabgrass, Canadian Thistle, Nutgrass, Poison Oak, Blackberry, Tansy Ragwort, Bermudagrass, Johnson Grass, Poison Ivy, Nut Sedge, Nimble Will, Bindweed, Bent Grass, Wild Garlic, Perennial Sorrel and Brome Grass.

1.05 QUALITY ASSURANCE

A. Sod Producer: Company specializing in sod production and harvesting with a minimum of 5 years experience.

B. Sod: Root development that will support its own weight, without tearing, when suspended vertically by holding the upper two corners.

1.06 REGULATORY REQUIREMENTS

A. Comply with regulatory agencies for fertilizer and herbicide composition.

1.07 MAINTENANCE DATA

A. Submit recommended maintenance procedures to be followed by Owner.

B. Include maintenance instructions, cutting method and maximum grass height; types, application frequency, and recommended coverage of fertilizer.

1.08 DELIVERY, STORAGE, AND HANDLING

A. Deliver sod on pallets. Protect exposed roots from dehydration.

B. Do not deliver more sod than can be laid within 24 hours.

1.09 MAINTENANCE SERVICE

A. Maintain sodded areas immediately after placement until grass is well established, has achieved complete coverage, and exhibits a vigorous growing condition or until Date of Substantial completion whichever is longer. Maintenance period shall include minimum of two mowings.

PART 2 - PRODUCTS

2.01 MATERIALS

A. Sod: Cultivated grass sod; U-3 bermudagrass; with strong fibrous root system, free of stones, burned or bare spots, and weeds.

B. Fertilizer: Type proportions as recommended by manufacturer for specified grass type.

C. Water: Clean, fresh, and free of substances or matter which could inhibit vigorous growth of grass.

2.02 ACCESSORIES

A. Stakes: Equal to Dewitt 4” Biodegradable Staple. Green color.

2.03 HARVESTING

A. Machine cut sod and load on pallets in accordance with ASPA guidelines.

B. Cut sod with minimum 1/2 inch and maximum one-inch topsoil base.

PART 3 - EXECUTION

3.01 INSPECTION

A. Verify that prepared soil base is ready to receive the work of this Section.

B. Beginning of installation means acceptance of existing site conditions.

3.02 PREPARATION

A. Finish grade areas to be sodded so that the surface is smooth and is approximately 1 inch below adjoining sidewalks and other paved surfaces.

B. Remove all weeds and grasses from areas to be sodded.

C. Planting surface shall be made friable by approved method of scarification. Prepared surface shall be floated smooth and free of bumps and depressions. Remove stones and foreign matter over 2 inches in diameter from top 2 inches of sod bed. Plant immediately thereafter, provided the bed has remained in a friable condition and has not become muddy or hard. If it has become hard, till to a friable condition again.

D. Apply fertilizer per soil tests recommendation.

E. Apply fertilizer no more than 48 hours before laying sod.

F. Lightly water to aid the dissipation of fertilizer.

G. Prior to laying sod, incorporate soil amendments such as lime and sulphur at rates recommended by soils tests to a 4-inch depth.

3.03 LAYING SOD

A. Moisten prepared surface immediately prior to laying sod.

B. Remove plastic netting from sod.

C. Lay sod immediately on delivery to site within 24 hours after harvesting to prevent deterioration.

D. Lay sod tight with no open joints visible and no overlapping; stagger end joints 12-inches minimum. Do not stretch or overlap sod pieces.

E. Finished sodding to be smooth and free of bumps and depression. Surface to be flush with adjoining grass areas if any. Place top elevation of sod approximately 1/2 inch below adjoining edging, paving and curbs. Grade planting surface as necessary to accomplish above.

F. On slopes 4 inches per foot and steeper, lay sod perpendicular to slope and secure every row with biodegradable pegs at maximum 2 feet on center. Drive staples flush with soil portion of sod.

G. Water sodded areas deeply immediately after installation.

H. After sod and soil have dried sufficiently, roll sodded areas to ensure good bond between sod and soil and to remove minor depressions and irregularities.

3.04 WARRANTY

A. Sodded areas to be vigorously growing at time of final acceptance or if installation occurs during dormancy warranty to extend through first month of following growing season. At conclusion of
   1. initial warranty period replace dead or unhealthy sod.

3.05 MAINTENANCE

A. Mow grass at regular intervals to maintain at a maximum height of and 2-1/2 inches for Bermudagrass. Do not cut more than 1/3 of grass blade at any one mowing.

B. Neatly trim edges and hand clip where necessary.

C. Immediately remove clippings after mowing and trimming.

D. Water sufficiently to ensure establishment and maintain vigorous appearance.

E. Roll and/or topdress surface as needed to remove minor depressions or irregularities.

F. Control growth of weeds. Apply herbicides in accordance with manufacturer's instructions.
   1. Remedy damage resulting from improper use of herbicides.

G. Immediately replace sod in areas which show deterioration or bare spots. Any areas that have had topsoil washed away shall be filled to match specified grade with topsoil before resodding.

H. Protect sodded areas with warning signs during maintenance period.

I. Apply approved fertilizer at rate to provide 1-1/2 pounds of actual Nitrogen per 1000 square feet every 25 days during growing season.

J. For the purpose of establishing an acceptable standard, no bare areas will be permitted.

END OF SECTION

SECTION 33 4100
SUBDRAINAGE

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Building Perimeter Drainage Systems.

B. Filter aggregate and fabric and bedding.

1.02 RELATED REQUIREMENTS

A. Section 31 2316 - Excavation: Excavating for subdrainage system piping and surrounding filter aggregate.

B. Section 31 2316.13 - Trenching: Excavating and backfilling for site subdrainage systems.

C. Section 31 2323 - Fill: Backfilling over filter aggregate, up to subgrade elevation.

1.03 REFERENCE STANDARDS

A. ASTM D2729 - Standard Specification for Poly(Vinyl Chloride) (PVC) Sewer Pipe and Fittings 2021.

1.04 SUBMITTALS

A. See Section 01 3000 - Administrative Requirements, for submittal procedures.

B. Product Data: Provide data on pipe drainage products, pipe accessories.

C. Shop Drawings: Indicate dimensions, layout of piping, high and low points of pipe inverts, gradient of slope between corners and intersections.

D. Project Record Documents: Record location of pipe runs, connections, cleanouts and principal invert elevations.

PART 2 PRODUCTS

2.01 REGULATORY REQUIREMENTS

A. Comply with applicable code for materials and installation of the work of this section.

2.02 PIPE MATERIALS

A. Polyvinyl Chloride Pipe: ASTM D2729; plain end, 6 inch inside diameter; with required fittings.

B. Use perforated pipe at subdrainage system; unperforated at downspout recieptors.

2.03 AGGREGATE AND BEDDING

A. Filter Aggregate and Bedding Material: Granular fill as specified in Section 31 2323.

B. Impervious Fill Material: General fill as specified in Section 31 2323.

2.04 ACCESSORIES

A. Pipe Couplings: Solid plastic.

B. Filter Fabric: Water pervious type, black non woven polyester or polypropylene.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify that trench cut is ready to receive work and excavations, dimensions, and elevations are as indicated on layout drawings.

3.02 PREPARATION

A. Hand trim excavations to required elevations. Correct over-excavation with aggregate fill..

B. Remove large stones or other hard matter that could damage drainage piping or impede consistent backfilling or compaction.

3.03 INSTALLATION

A. Install and join pipe and pipe fittings in accordance with pipe manufacturer's instructions.

B. Place drainage pipe on filler aggregate bed on filter fabric on clean cut subsoil. Allow for additiona width of filter fabric to wrap sides and cover top of filler aggregate.

C. Lay pipe to slope gradients noted on drawings; with maximum variation from true slope of 1/8 inch in 10 feet.

D. Place pipe with perforations facing down. Join pipe ends.

E. Install filter aggregate at sides, over joint covers and top of pipe. Provide top cover compacted thickness of 12 inches.

F. Fold filter fabric over levelled top surface of aggregate cover overlap the full with of trench and sucure prior to subsequent backfilling operations.

G. Place aggregate in maximum 4 inch lifts, consolidating each lift.

H. Refer to Section 31 2323 for compaction requirements. Do not displace or damage pipe when compacting.

I. Place impervious fill over drainage pipe aggregate cover and compact.

J. Connect to drain line to daylight with unperforated pipe . Ensure positive drainage o daylight.

3.04 PROTECTION

A. Protect pipe and aggregate cover from damage or displacement until backfilling operation begins.

END OF SECTION